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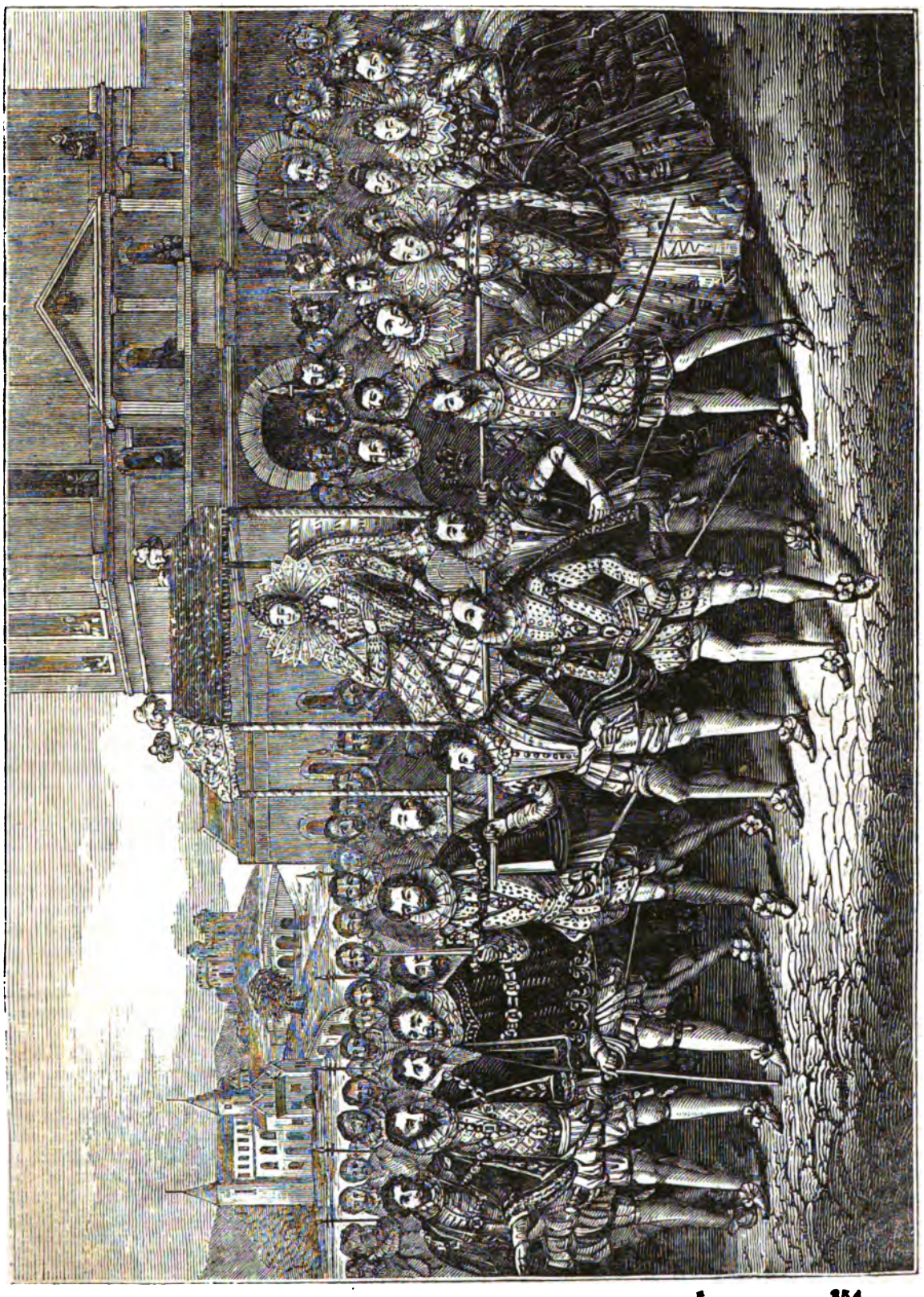

Queen Elizabeth in one of her Progresses, borne by six Gentlemen, and attended by her Court

QUEEN ELIZABETH; HER PROGRESSES AND PUBLIC PROCESSIONS.

No. I.

INTRODUCTION.

IT was remarked in the last century by Bishop Percy, that the splendour and magnificence of Elizabeth's reign are nowhere more strongly painted than in the little diaries which have come down to us of some of her Progresses, or Summer excursions to the houses of her nobility. It may be added with equal truth, that nowhere do we meet with more interesting and instructive illustrations of the manners and taste of that age—an age which, for many reasons, has always been particularly attractive to Englishmen. The same learned and accomplished prelate likewise observed that a more acceptable present could not be given to the world than a republication of a select number of the most interesting accounts,—such as those relating to the entertainments which the Earl of Leicester gave the Queen at Kenilworth Castle in 1575, or to that which the Earl of Hertford gave her Majesty at Elvetham, in 1591. Several years have now elapsed since the desideratum then pointed out in our literature, was more than supplied by the able research and indefatigable industry of Mr. Nichols, who published, in three quarto volumes, all the accounts which he could collect from original contemporary manuscripts, or from scarce pamphlets, &c., concerning the progresses, public processions, and other ceremonials which occurred in the reign of this celebrated queen. Valuable, however, as were the labours of Mr. Nichols, his work is rather a book of reference, or collection of authentic records and documents, than a narrative digested from the materials which he had amassed; its character, therefore, no less than its bulk, renders it not very well fitted to the general reader. Under these circumstances, we deem that we shall be offering an acceptable present, in the phrase of Bishop Percy, to our readers, in furnishing them with a series of papers, descriptive of the progresses of Queen Elizabeth, her public processions, and such other similar matters as tend to illustrate the taste and manners which prevailed in our country during her reign.

The practice of making progresses in different parts of her kingdom, is a striking feature in the plan of popularity which Elizabeth seems to have followed from the beginning of her reign. The spirit of the times encouraged those splendid recreations, when the habits and amusements of the great possessed so different a character from that which they have in more modern times. To show the impression which these progresses made upon the people generally we shall first quote the words of a contemporary poet, who was one of Elizabeth's gentlemen pensioners,—we mean Puttenham, whose *Arte of English Poesie* has secured the transmission of his name to our days. In one of his poems in praise of the Queen, he thus addresses her:—

> Thou that besydes forreyne affayres
> Canst tend to make yerely repayres,
> By Sommer progresse and by sporte,
> To shire and towne, citye and porte,
> To view and compasse all thye lande,
> And take the hills with thine own hande
> Of clowne and earle, of knight and swayne,
> Who list to thee for right complayne,
> And therin dost such justice yeelde,
> As in thy sexe folke see but seelde;
> And thus to do arte less afrayde,
> With houshold trayne, a syllye mayde,
> Than thyne annoestours one of tenne
> Durst do with troopes of armed men.

In the *Character of Queen Elizabeth*, by Edward Bohun, a writer of the seventeenth century, the scheme of her progresses is thus explained:—

In the Summer she for the most part lived in the countrey; and she took her royal progresses into the several counties of England, and she would amuse herself with considering and commending the pleasantness and goodness of her country, and the greatness and variety of the fruits England produced; she would also admire the wisdom and goodness of God in diversifying the face of the earth, by the mixture of fields, meadows, pastures, and woods; and she would, as occasion offered, hunt too. In all this she was intent upon that which was her main business, the government of her people, the management of her family and of her revenues, and the observing the state and condition, the carriage and designs, of the neighbour states and princes. Which way soever she went, she was sure to draw upon her the eyes of her people: innumerable crowds of them met her in all places with loud hearty acclamations, with countenances full of joy, and hearts equally filled with love and admiration: and this ever attended her in publick and in private: for what sight in this world can possibly please mortals like that of a just, beneficent, and kind prince? So that those places were accounted the most happy, in which, for the goodness of the air or the pleasantness of the fields, she was pleased to stay the longest.

He then proceeds to describe her extreme affability and condescension during these journeys, and the effect thereof upon her people:—

In her progress she was the most easy to be approached; private persons and magistrates, men and women, country people and children, came joyfully, and without any fear, to wait upon her and see her. Her ears were then open to the complaints of the afflicted, and of those that had been any way injured. She would not suffer the meanest of her people to be shut out from the places where she resided, but the greatest and the least were then in a manner levelled. She took with her own hand, and read with the greatest goodness, the petitions of the meanest rusticks: and she would frequently assure them that she would take a particular care of their affairs, and she would ever be as good as her word. She, by her royal authority, protected those that were injured and oppressed: she punished the fraudulent, false, perfidious, and wicked. In all this variety of affairs she was able to keep her temper, and appear with an equal and uninterrupted serenity and humanity to all that came nigh her; she was never seen angry with the most unseasonable or uncourtly approach: she was never offended with the most impudent and importunate petitioner. There was no commotion to be seen in her mind; no reproaches, no reprehensions came from her. Nor was there anything in the whole course of her reign that more won the hearts of the people than this her wonderful facility, condescension, and the strange sweetness and pleasantness with which she entertained all that came to her. Thus, for the most part, she spent her Summer.

When Queen Mary died, on the 17th of November, 1558, Elizabeth was at Hatfield. On the 23rd of November, she made a magnificent progress from thence to the Charter-house in London; which was the prelude to her passage through the city from the Tower to Westminster, on the 13th of January following, the day before her coronation. In the Summer of 1559, she made an excursion from Greenwich to Dartford and Cobham, and afterwards to Eltham, Nonsuch, and Hampton Court. In 1560, she went in progress to Winchester and Basing. In the third year of her reign, 1561, she began her progress through Essex, Suffolk, and Hertfordshire; and on her return, she passed from Hertford Castle through Enfield, Islington, and over St. Giles in the Fields (which did not then belie its name,) to St. James. In 1563, she received the congratulations of the Eton scholars at Windsor Castle, and in the next year, those of the University of Cambridge at King's College. In 1564 likewise, she went into Huntingdonshire and Leicestershire; in 1565, to Coventry, and the year following to Oxford, in compliment to Dudley, Earl of Leicester, then Chancellor of that University; and to Burghley, on a visit to her Treasurer, the great Cecil. In 1567,

she was in Berkshire, Surrey, and Hampshire; in 1568, in Kent, Essex, Hertfordshire, and Northamptonshire; in 1569, in Surrey and Hampshire. In 1570, Elizabeth went into the city again, to honour Sir Thomas Gresham on the occasion of his building the Royal Exchange; she was likewise entertained by him in 1573, at his mansion at Mayfield in Sussex; and some time between 1577 and 1579 at his house at Osterley near London. In 1571, she visited Hunsdon House, which had formerly been her nursery, and which she gave to her first cousin, Henry Cary, whom she had created Baron Hunsdon. On May-day, 1572, she was entertained at Greenwich, with many warlike feats, by the citizens of London; the coming of the French ambassadors in the same year, was the occasion of great festivities, and after their departure, the Queen proceeded on a progress into Essex, Kent, Herts, Bedfordshire, to Kenilworth, Warwick, Reading, Windsor, and Hampton Court; at which last place, about the end of September, she fell ill of the small-pox. In 1573, she passed through a part of Surrey and Sussex, and honoured many places in Kent with her presence. She visited Archbishop Parker at Croydon; and seems to have intended paying him another visit in 1574; in which year also, she was amused at Bristol with the regular siege of a fort; was entertained by the Earl of Pembroke at Wilton, and visited the city of New Sarum.

In 1575, the Queen made a progress through the counties of Northampton, Oxford, and Worcester; and it was during this progress, that she was so magnificently entertained for nineteen days by the Earl of Leicester at Kenilworth*. In 1577, she was again in Kent, Surrey, and Sussex, and spent three days at Sir Nicholas Bacon's mansion at Gorhambury. In 1578, she went over Norfolk, Suffolk, and Cambridgeshire; and received the compliments of the University of Cambridge on her way, at Audley Inn. In 1579, she again visited Essex and Suffolk. In 1581, she received ten commissioners from the King of France concerning her marriage with the Duke of Anjou; and in their honour, a "Triumph" was performed with great solemnity.

From 1581 to 1588, the Queen appears to have remained quiet at Westminster; her amusements consisting of shows and tiltings on the reception of foreign princes and ambassadors. In the latter year, which is memorable for the projected invasion of her kingdom by the Spaniards, and the defeat of their grand Armada, Elizabeth paid her celebrated visit to her army at Tilbury Fort. In 1591 we find her recommencing her progresses over Surrey, Sussex, and Hampshire, and being entertained at Cowdry, Southampton, and Elvetham; and the next year at Bisham, Sudley and Ricott, with all the fantastic pomp which characterized the age. In 1592, likewise, she paid a second visit to Oxford, in compliment to Lord Burleigh, who was then Chancellor of that University. In 1594, the students of Gray's Inn entertained her with a masque; and next year the Earl of Essex celebrated the anniversary of her accession with a "device." In 1599, she went again over part of Berkshire. In 1600, she honoured the wedding of Lord Herbert with her presence, in Black Fryers, and was there entertained with dancing and a masque at the Lord Cobham's, and even "dawnced †" herself, though in her sixty-eighth year. In 1600, also, and the following year, she made progresses into Surrey, Hampshire, Wiltshire, and Berks; and in 1602, she made short visits from the capital into Middlesex and Kent. In the year 1603, she closed her reign and life.

The Puritans in Elizabeth's time, condemned much of the gaiety and splendour of the court, but the queen was exhorted from the poetical press, not to regard their objections. The poet and gentleman pensioner, George Puttenham, in a poem, or rather collection of poems, styled *Partheniades*, which he devoted as a new year's gift to the Queen in 1579, has some lines written for the purpose of maintaining "agaynste the Puritantes," that "amonge men many thinges be allowed of necessitye, many for ornament, which cannot be misliked nor well spared, without blemishe to the cyvile life;" and that "all auncyent courtly usages, devised as well for the publique intertaynments, as for other private solaces and disportes," are "not scandalously evill or vicious." The muse Calliope, addressing the Queen, recounts a list of calamities which must result from adopting the obnoxious principles:

> Deny honoure to dignity
> And triumphe to just victorie
> Pull puissance from soverayntie
> And credit from authoritee
> From holy-dayes and fro weddinges
> Minstrells and feasts and robes and ringes
> Take fro kinges courtes intertaynments;
> From ladyes riche habillimentes:

And then indignantly exclaims—

> Princesse! yt ys as if one take away
> Green woodes from forrests and sunne-shine fro the daye.

The chances of success in this contest, were naturally with the poets. The innovating spirit of the Puritans rendered them very unacceptable to the Queen; and the manner in which they put forward their demands, was not at all calculated to ensure their success. Camden thus describes the "Insolency of the Puritans," in the year 1588, in which year, he tells us, that England was "pestered with schism."

> Certainly, (he says,) never did contumacious impudency and contumelious malapertness against ecclesiastical magistrates, show itself more bold and insolent. For when the Queen (who was always the same) would not give ear to innovatours in religion who designed (as she thought) to cut in sunder the very sinews of her ecclesiastical government and her royal prerogative at once, some of those men who were great admirers of the discipline of the church of Geneva, thought there was no better way to be taken for establishing the same in England, than by inveighing and railing against the English hierarchy, and stirring up the people to a dislike and hatred of the bishops and prelacy. These men, therefore, set forth scandalous books against both the church government and the prelates, the titles whereof were, *Martin Marre-Prelate, Mineralis, Diotrephes, a Demonstration of Discipline, &c.* In these libels they belched forth most virulent calumnies and opprobrious taunts and reproaches in such a scurrilous manner, that the authors might seem to have been rather scullions out of the kitchen than pious and godly men. Yet were the authors thereof (forsooth) Penry and Udal, ministers of the word, and Job Throckmorton, a learned man and of a facetious and gybing tongue. Their favourers and upholders were Richard Knightley, and Wigston, Knights, men otherwise good, grave, and sober, but drawn in by certain ministers, who aimed at some private respects of their own, for which the said knights had smarted by a heavy fine laid upon them in the Star-Chamber, had not the Archbishop of Canterbury, (such was his mildness and good nature,) with much adoe requested and obtained a remission thereof from the queen.

But if the Queen had been disposed to abolish what the Puritans disliked, she had not the power to do so. She did not, as Mr. Sharon Turner remarks, like Charles the Second, make the manners of her

* See *Saturday Magazine*, Vol. I., p. 101.

† The fondness of Queen Elizabeth for music and "dawncing" in her old age, is thus noticed in a letter from the Earl of Worcester to the Earl of Shrewsbury, dated September 19, 1602, and printed by Mr. Lodge, from the Talbot MSS., in his *Illustrations of British History*: "Wee are frolyke heare in Courte; mutche dawncing in the privi chamber of contrey dawnces before the Q. M. (Queen's Majesty) whoe is exceedingly pleased therwth. Irishe tunes are at this tyme most pleasing," &c.

court. She found them as they were; poets reprimanded them, but the nobility were too formidable, and her crown too precarious from their cabals, to allow her to alter their state or enjoyments. She had no choice but to join the festivities they expected and required. It was the general taste, as well as his own, and not peculiarly the queen's inclination, that Leicester sought to gratify by his magnificent festivities at Kenilworth.

It has been oftentimes objected to these progresses that they were calculated only to impoverish her wealthy subjects under colour of honouring them,—that, in fact, they were an instrument of oppression in the hands of the Queen. With reference to the poorer classes of the people, it is allowed that she seemed on all occasions willing to spare them; but for those of better rank and fortune, it is said that she had no consideration, but that, on the contrary, she contrived in many ways to pillage and distress them.

It was the tameness of that time, (says a speaker in one of Bishop Hurd's Dialogues,) to submit to every imposition of the sovereign. She had only to command her gentry on any service she thought fit, and they durst not decline it. How many of her wealthiest and best subjects did she impoverish by these means, (though under colour you may be sure of her high favour); and sometimes by her very visits!

An old writer, in a *Description of England*, speaking of the variety of the Queen's houses, checks himself with saying,—

But what shall I need to take upon me to repeat all, and tell what houses the Queen's Majesty hath, sith all is hirs? And when it pleaseth hir in the Summer season to recreate hirself abroad and view the state of the countrie, and hear the complaints of her unjust officers or substitutes, every nobleman's house is hir palace where she continueth during pleasure, and till she returne againe to some of hir owne; in which she remaineth as long as pleaseth hir.

The historian Carte, expressing the opinion that "Queen Elizabeth made it her business to depress the nobility," and that "even her appearing favours ministered to this purpose," adds,—

Whether she stayed a time with any of them in her progress, (as she did A.D. 1601, for a fortnight together, with the Marquis of Winchester at Basing, or only took a dinner,) they paid very dear for the honour of the visit; and whatever exorbitant expence she put them to, she did not think herself well entertained unless they made her a rich present at parting. Thus, dining on December 6th, not four months before her death, at Sir Robert Cecil's, he made her, when she went away, according to the custom, presents to the value of two thousand crowns. Her ministers might, perhaps, be able to support such an expense; but by impoverishing the nobility, who were generally discontented at their usage, it sunk their credit so low that it was impossible for any of them to get a number of followers, were they never so inclined to make a disturbance.

In Sir Henry Ellis's *Original Letters illustrative of English History*, are a few epistles illustrative of the feelings of some of Queen Elizabeth's subjects, when they heard that her Majesty had vouchsafed to honour them with a visit during her Progresses; and the editor remarks, that it will be readily gathered from those letters, how inconvenient to many these Progresses must have been. Sir Nicholas Bacon, the Lord Keeper, in a letter to Lord Burghley, concerning the Queen's contemplated visit to him at Gorhambury, in 1572, rejoiced much that her Majesty intended to do him so great an honour, but owned himself quite a novice in receiving royalty. The Earl of Bedford, writing to Lord Burghley in the same year, announces his intention of preparing for her Majesty's coming to Woburn, "which shall be done," he says, "in the best and most hartiest manner that I can;" but he trusts, at the same time, that the Lord Treasurer "will have in remembraunce to provide and helpe that her Ma^ts tarieng be not above two nights and a daye," hinting, indeed, that he has made preparation for no longer time.

"Archbishop Parker," says Sir Henry Ellis, "was one of the few who seemed thoroughly pleased at one of these intended visits. A thought struck him to make it subservient to the promotion of the protestant religion." This visit, which we shall describe on a future occasion, was paid to the Archbishop of Canterbury in 1573, and in his letter to the Lord Treasurer, he says,—

It would much rejoyce and stablishe the people here in this religion, to see her Highness that Sondaye (being the first Sonday of the moneth, when others also customablie may receive) as a godlie devoute prince, in her chiefe and metropolituall churche, openly to receive the communyon. which by her favour I would minister unto her. *Plurima sunt magnifica et utilia; sed hoc unum est necessarium.* [Many things are magnificent and useful; but this one is necessary.] I presume not to prescribe this to her Highnes, but as her trustie chapleyn shewe my judgement.

Strype tells us that a rumour of the small-pox and measles being at Canterbury, caused some stop of the Queen, and made the archbishop stay some of his carriages. "For as in fifteen years it should rejoice him, as he told the lord treasurer, to see her Majesty at his house at Canterbury, the cost whereof he weight not; so he would be loth to have her person put in fear or danger."

In the year 1577, Lord Buckhurst, who expected to receive her Majesty at Lewes, was so forestalled in respect of provisions, by other noblemen in Sussex and the adjoining counties, that he was obliged to send for a supply from Flanders. He thus writes to the Earl of Sussex:—

My very good lord,—

I besech your lordship to parᵭon me yf thus I shall becom troblesome unto you, to know some certenty of the Progres yf it may possibly be. The time of provision is so short, and the desire I have to do all thinges in such sort as appertaineth, so great, as I can not but thus importune your lordship to procure her H. to grow to some resolucion, both of the time when her Ma. will be at Lewis, and how long her H. will tary theare. For having alredy sent in to Kent, Surrey, and Sussex, for provision, I assure your lordship I find alredy all places possest by my lord of Arundell, my lord Mountague, and others. So as of fors I am to send in to Flaunders, which I wold spedely do yf the time of her Ma. coming and tarians with me were certain. I besech your lordship, therefore, yf it may be, let me know by your Lo. favourable means somewhat whereunto to trust, for if her H. shall not presently determin, I se not how possibly we may or can perform that towardes her Ma. which is du and convenient.

When Mr. (afterwards Sir) Michael Hickes, Lord Burghley's secretary, was married, in 1597, the Queen hinted that she would honour him. Hickes wrote to a friend at court to ask the Lord Chamberlain what preparation he should make; and his friend told the Lord Chamberlain that it troubled Hickes, "that he had noe convenient place to entertainé sum of her Ma^ties necessary servants." The Lord Chamberlaine's reply is thus communicated to Hickes by his friend:—

His answeare was, that you weare unwise to be at aine such charge: but onelie to leave the howse to the Quene: and wished that theare might be presented to her Ma^tie from your wief, sum fine wastcoate, or fine ruffe, or like thinge, which he said would be acceptablie taken as if it weare of great price.

Sir Henry Ellis notices it as a fact not generally known, that much as these visits sometimes put the Queen's subjects to expense, "the cost of them to the public treasury was also a matter of deep concern."

Among the Lansdowne Manuscripts in the British Museum, is "an Estimate of increase of Chardgies

in the time of Progresse, which should not be if her Majestie remeynid at her Standing Howses within xx. myles of London; collected out of the Creditors of the last Progresse, Anno, xvto. Reginæ Elizabeth," A.D. 1573. It is altered and corrected in Lord Burghley's hand. The increase of charges caused by the Progress, appears to have amounted in the whole to 1034*l.* 0*s.* 6*d.*

Lord Burghley, it is probable, (says Sir Henry Ellis,) would have been personally glad, if the Progresses could have been altogether dispensed with. The Queen's visits to him were extremely frequent. His Lordship's treatmen of the Queen's suite when she went to Theobalds, seems not to have been generally acceptable to the visiters. In more than one letter we find the writers vexed when they learned they were to go there.

Yet, although the Queen's visits might have put her nobles to considerable expense and inconvenience, the inference is not necessarily to be drawn that those visits were unacceptable, and that the parties to whom they were paid, thought the honour of receiving them an insufficient compensation for the cost and annoyance which they occasioned. Are we sure, as Mr. Nichols asks, that Leicester thought he paid too high a price for the gratification of his ambition,—or that the Earl of Hertford regretted the expense of regaling her Majesty at Elvetham, to regain her long forfeited favour; or that Sir Robert Cecil thought much of the great entertainments he gave her at Theobalds, when she conferred the honour of knighthood on him in 1591, and it was expected that he would have been advanced to the secretaryship. Cecil, indeed, glories how much Theobalds was increased by occasion of her Majesty's often coming; "whom to please," says he, "I never would omit to strain myself to more charges than building it." The strong desire of Elizabeth's subjects to please her in her progresses, was never more strikingly shown than on the occasion of a visit which she paid to Sir Thomas Gresham, the founder of the Royal Exchange, at the mansion which he had built at Osterley, in Middlesex. Her Majesty happened to find fault with the court of the house, observing that it was too great, and that it would appear more handsome if divided with a wall in the middle.

What doth Sir Thomas, but in the night time send for workmen to London, (money commands all things,) who so speedily and silently apply their business, that the next morning discovered the court double, which the night had left single before. It is questionable whether the Queen next day was more contented with the conformity to her fancy, or more pleased with the surprise and sudden performance thereof.

Her courtiers amused themselves with sundry witticisms upon the transformation; some observing that it was no wonder he could so soon *change a building* who had been able to *build a Change*; while others, reflecting on some well known differences in the knight's family, remarked that a house was easier *divided* than *united*.

The visits which Elizabeth paid to Cecil were frequent. She was twelve times at Theobalds, which stood at a very convenient distance from London. Each visit cost Cecil two or three thousand pounds—a large sum in those days; the Queen staying with him "at his lordship's charge," sometimes three weeks or a month, or six weeks together.

Sometimes she had strangers or embassadors come to her thither, where she has been seen in as great royalty and served as bountifully and magnificently as at any other time or place, all at his lordship's expense, with rich shows, pleasant devices, and all manner of sports that could be devised, to the great delight of her Majesty and her whole train, with great thanks from all who partook of it, and as great commendations from all that heard of it abroad. His lordship's extraordinary charge in entertaining of the Queen, was greater to him than to any of her subjects. But his love to his sovereign, and joy to entertain her and her train, was so great, as he thought no trouble, care, or cost, too much, but all too little, so it were bountifully performed to her Majesty's recreation, and the contentment of her train.

It appears, moreover, that although Elizabeth was fond of magnificence and show, and wished to be royally entertained, she, nevertheless, "misliked superfluous expense" in her progresses. Puttenham, in his *Arte of English Poesie*, after laying down a number of rules to regulate the carriage of courtiers to their sovereigns, observing that, in playing with a prince, it is decent to let him sometimes win of purpose, "to keepe him pleasant," and never to refuse his gift, "for that is undutifull; nor to forgive him his losses, for that is arrogant, nor to give him great gifts, for that is either insolence or follie, nor to feast him with excessive charge, for that is both vaine and envious," adds—

And therefore the wise prince, King Henry the Seventh, her Majesty's grandfather, yf his chaunce had been to lye at any of his subjects' houses, or to passe moe meales then one, he that would take upon him to defray the charge of his dyet, or of his officers and houshold, he would be marvelously offended with it, saying—What private subject dare undertake a Prince's charge, or looke into the secret of his expense? Her Majestie hath bene knowne oftentimes to mislike the superfluous expense of her subjects bestowed upon her in times of her progresses.

Much of the manners of the times may be learned from these Progresses.

They give us (says Mr. Nichols) a view into the interior of the noble families, display their state in housekeeping, and other articles, and set before our eyes their magnificent mansions, long since gone to decay, or supplanted by others of the succeeding age. Houses that lodged the Queen of England and her Court, are now scarcely fit for farms, or levelled with the ground or rebuilt. Such were the seat of the Compton family at Mockings; of the Sadleirs at Standon; of the great Burleigh at Theobalds; of the Earl of Leicester at Kenilworth; of the Bishop of Ely at Somersham; Sir Thomas Cook's at Giddyhall; Sir Thomas Mildmay's at Moulsham; Lord Rich's at Leighs; Sir Thomas Waldgrave's at Smallbridge; Mr. Tuke's at Layer Marney. The royal palaces are almost all gone.

Our illustration is copied from a very celebrated engraving by Vertue—one of his "Historic Prints," which he copied, in 1737, from the original picture in the possession of the Earl of Oxford, at Coleshill in Warwickshire. It had then been in the hands of that family for fifty or sixty years; but no account of it had been handed down, except that it was painted in memory of Queen Elizabeth's visit to a young married couple. Who the parties thus honoured were,—and when or where the visit was made,—were points wholly unexplained. Vertue himself, after much consideration, came to the conclusion that it represented a visit to Henry Cary, Lord Hunsdon, at Hunsdon House in Hertfordshire, where she is known to have been in September, 1571; and that it was the work of Mare Gerrards of Bruges, painter to Queen Elizabeth. But the appropriation of the scene to Hunsdon House, has been controverted in the British Topography as having every probability against it.

The queen is seated in a canopy-chair of state, carried by six gentlemen; several knights of the garter with their collars are walking before the queen, and many favourite ladies following in the train. Her yeomen of the guard follow, and the band of gentlemen pensioners line the way.

I have some reasons to think (says Vertue) that amongst the ladies that follow the Queen, the foremost in white may be the Lady Hunsdon; on her right hand, Lord Hunsdon's sister, Lady Katherine, who was wife to Admiral Howard, and next behind, in a dark grave habit, Lady Mary Boleyn, mother of Lord Hunsdon: all the ladies are richly adorned with jewels, &c., to grace the solemnity of this procession.

THE HUMAN HEART.

HAD man been a mere animal machine, destitute of reason, he would have been the most defenceless creature on earth. The elephant possesses an instrument by which he can grasp his enemy, and an enormous weight by which he can trample him to death. The bear is endowed with a degree of muscular strength, by which he can compress the human figure with as much facility as we break a nutshell. The lion and the tiger can spring upon their prey, and fix it by their claws to the earth until they satiate their hunger. But the infant, what a helpless being it is, and remains, long after it first sees the light! The idiot who never enjoyed reason; the melancholy maniac who has been deprived of it: how pitiably weak and dependent are they, compared with the rhinoceros or the eagle! Nevertheless, it has been given to man to subdue all the tribes of animated nature to his use, and he has fulfilled his destiny in that respect by means of his hand, the most perfect physical instrument with which we are acquainted. Not all the skill of man has yet been able to imitate the hand in its formation and functions, or to suggest an improvement in one of its joints or muscles. Galen's enthusiastic and eloquent description of it, which the reader will find translated in Dr. Kidd's volume, though unrivalled in ancient or modern literature, scarcely does justice to the flexibility, delicacy, and strength of this admirable instrument. But it is, after all, nothing more than an instrument; it would have been, comparatively, powerless, had it not been moved to action by the rational faculty of which it is the immediate servant.

Yet, although it is by means of the hand that we operate upon external matter, we cannot perceive, as Sir Charles Bell justly remarks, any relation between that instrument and the mind. The hand is not more distinct from the rose which it is about to pluck, than the mind is from this organ of its volition. Indeed, we must all feel that the pulse which beats at the wrist, has nothing whatever to do with our will. We may use the hand for our purposes, but its machinery, its vitality, do not in any way depend upon our dictates. The action of the heart, the circulation of the blood, are carried on by laws to which the mind is no party. Had it been otherwise, a single act of omission in ordering the requisite functions on our part, might bring life to a premature termination. The fracture of a small filament in the admirable tracery of nervous cords which unites many organs in sympathy, would produce spasm, suffocation, and death. Thus, then, we have two principles of vitality in us,—one, that of the mind,—the other, that of the frame in which it is enveloped; each perfectly distinct, and manifestly the work of a Superior Intelligence, who has given us a control over the operations of both, but has taught us the secret of immortality, in the laws which disclose their separate existence. The planets move round the sun by his attraction; the blood circulates through our frame by no relation to the mind. The planets and the sun itself shall perish; the blood shall cease to circulate, and the fairest fabric of mortality shall moulder in the dust; but the mind lives independently of matter, as matter does of mind, and can no more be affected, as to its vital essence, by the destruction of the body, than Sirius would be by the extinction of our entire solar system.

Not only are the vital functions of the body independent of our will, but each of our organs has been endowed, without any consent or previous knowledge on our part, with powers admirably suited to its purpose; powers which are not the result of life either of the mind or the body, but of special legislation, founded on premeditated design, and accomplishing an adaptation of means to end, wonderful for their perfection. Thus the heart, to which the lover appeals as the seat of his ardent feelings, as the most sensible organ of his system, may be rudely pressed by the hand without conveying to him the sensation that it has been touched. Harvey's celebrated experiment puts this fact beyond a doubt.

It happened that a youth of the noble family of Montgomerie had his interior exposed in an extraordinary manner, in consequence of an abscess in the side of the chest, which was caused by a fall. The youth was introduced to the presence of Charles the First, and Harvey, putting one hand through the aperture, grasped the heart, and so held it for some time, without the young man being at all conscious that any new object was in contact with it. Other observations have since confirmed this discovery, and the heart is now universally declared by medical men to be insensible! Nevertheless, we all well know that the heart is affected not only by the emotions of the mind, but by every change that takes place in the condition of the body. Here, then, is a complete proof of design. The heart insensible to *touch*, which, from its internal position, it was never intended to experience, is yet sensibly alive to every variation in the circulation of the blood, and sympathizes in the strictest manner with the powers of the constitution. There is nothing, however, in the mere principle of life, still less in the physical texture of the heart, to give it insensibility to touch, and sensibility to feeling of the most active and refined description. As life is animation added to the body when formed, so this peculiar susceptibility of the heart is an endowment added to the organ by Him who made it.—*Quarterly Review.*

THE STOMACH.—"I firmly believe that almost every malady of the human frame is, either by high-ways or by-ways, connected with the stomach. The woes of every other member are founded on your belly timber; and I must own, I never see a fashionable physician mysteriously consulting the pulse of his patient, but I feel a desire to exclaim,—Why not tell the poor gentleman at once, 'Sir, you have eaten too much; you've drunk too much, and you have not taken exercise enough!' The human frame was not created imperfect. It is we ourselves who have made it so. There exists no donkey in creation so overladen as our stomachs."—*Bubbles from Nassau.*

How frail and inconsistent is men! How different does he think and act even for himself, in different circumstances! How strangely does the same passion of pride seek for gratification from contrary causes, from pursuing ideal good, and from giving up that which is attainable and real! One moment he strains at a gnat, and applauds himself for sagacity, in the next he does not suspect himself of credulity when he swallows a camel.—PARR.

LONGEVITY.—In the third volume of Mr. Sharon Turner's *Sacred History of the World*, is the following passage:

"The salubrity of England, either from its climate, its manners, or its intellectual cultivation, to the more advanced periods of social life, is indicated by the fact that, in 1834, it was calculated that there were then seventy peers in the House of Lords, who were between seventy and eighty years of age, or a sixth part of the 426 of whom the House, including the bishops, consists. Eleven of these were noticed as octogenarians, or still older. These eleven peers were thus represented:—

Lord Wodehouse	93	Lord St. Helens	81
Lord Lyndoch	84	Earl Fortescue	81
Lord Stowell	89	Earl of Ranfurley	80
Lord Eldon	83	Earl Powis	80
Lord Scarsdale	83	Lord Middleton	80
Lord Carrington	82		

To these might have been added the Bishop of Norwich, the Earl of Egremont, and Lord Rolle, the two former of whom have paid the debt of nature: the last is still living.

USE AND MANUFACTURE OF BELLS

THE employment of sonorous metal in the form of bells, for the purpose of producing musical sounds, is of very great antiquity. We read of it in the Holy Scriptures, where bells are mentioned as being employed in religious ceremonies, and it was ordered by Moses that the lower part of the blue robe of the high priest should be hung with pomegranates and small bells. The same custom is noticed with reference to the kings of Persia; and in many parts of the East, at the present day, the mistress of the house has the lower part of her dress furnished with hollow pieces of metal, containing small stones, and these producing a sound as she moves, warn the domestics of her approach. Bells were used to decorate the heads of the war-horses of the Jews, in order to accustom them to noise. The Greeks and the Romans also used bells on many occasions, religious, civil, and military; in funeral processions, at sacrifices, and to announce the hour of bathing, and of rising in the morning; they were also rung at executions.

But although bells were known thus early, the manufacture of them appears to have been confined to those of a small size. The first church bells are supposed to have been cast at Nola, in Campania, in the year 400; but it is not until the beginning of the sixth century that their employment is known to a certainty. From this time, their use in churches rapidly spread in all directions; and at the end of the ninth century, scarcely a church or monastery, of any note, was unprovided with these lively harbingers of religious duties.

Among the Roman Catholics, many superstitious notions were attached to the employment and properties of bells. A church bell is noticed by antiquaries, inscribed with the following Latin verses, in which its valuable properties are summed up:—

Funera plango, fulgura frango, sabbata pango,
Excito lentos, dissipo ventos, paco cruentos;

which may be thus translated,—

I strike at a funeral, I disperse the thunder, I announce the sabbath,
I excite the lukewarm, I dissipate tempests, I soften the hearts of cruel men.

In allusion to another superstition regarding bells, we find in the *Golden Legend* of Wynken de Worde, one of our early English printers, that, "It is said, the evil spirytes, that ben in the regyon of thayre, doubte moche when they here the belles rongen: and this is the cause why the belles ben rongen when it thondreth, and when grete tempeste and outrages of wether happen, to the end that the feinds and wycked spirytes shold be abashed and flee, and cease of the movynge of tempeste."

The custom of naming bells and blessing them with certain religious ceremonies exists in the Roman church. Before bells are hung they are washed, crossed, blessed, and named, by the bishop.

The Chinese, have been from early times famous for the magnitude of their bells. The city of Nankin formerly possessed some of a very large size, but their weight was so enormous, that they brought down the tower in which they were hung. One of these bells is twelve feet in height, and seven in diameter: it is computed to weigh as much as two tons and a half. These bells were cast about three hundred years ago: they are four in number, and are named, the hanger, *tchoui;* the eater, *che;* the sleeper, *choui;* the will, *si.* A French author mentions seven other bells at Pekin, each of which weighs the enormous weight of six tons. But some of the bells in Russia exceed even these in weight; one in the church of St. Ivan's at Moscow weighs 127,836 lbs. "This was the largest bell known until Bovis Godenuf gave the cathedral of that city a bell weighing 288,000 lbs. This was again surpassed by the bell cast at the expense of the empress Anne, which weighs at the lowest computation 432,000 lbs., or between twenty-one and twenty-two tons*."

The largest bells in England are at Christchurch College, Oxford, weighing 17,000 lbs.; St. Paul's, London, 11,474 lbs.; and the great Tom of Lincoln, 10,854 lbs., the heaviest of these being only one-twentieth the weight of the Russian bell.

Although the English have nothing to boast of as to the size of their church bells, when compared with those of other nations, they have practised almost exclusively the art of bell-ringing. From a series of bells of different sizes, properly tuned, so as to produce when struck, the different notes of the gamut, many harmonious effects are obtained.

The practice of ringing bells in changes or in regular peals is said to be peculiar to England; the custom seems to have commenced with our Saxon ancestors, and to have been common before the Conquest. The tolling of a bell is nothing more than producing a sound by a stroke of the clapper against the side of the bell, the bell itself being in a pendant position, and at rest; but in ringing, the bell is elevated to a horizontal position, so that, by means of a wheel and rope, the clapper strikes forcibly on one side as it ascends, and on the other side on its return downwards, producing at each stroke a sound.

Bell-ringing having been reduced to a science in this country, has caused great attention to be paid to the process of casting bells, and preparing the metal.

Bell-metal is composed of tin and copper; but the proportions vary according to the size of the bell, or the judgment of the founder: the usual quantities are 23 lbs. of tin to 100 lbs. of copper. In large bells more copper is added, and sometimes in very small ones a portion of silver is used, which is said to improve the sweetness of the tone materially.

The method of casting a large bell is in the first instance to form a *core* which is to fill the inside of the bell while casting. For this purpose a hole is dug large enough to contain the bell, and to allow a free passage to the workman, during the operation of moulding. In the spot to be occupied by the centre of the mould, a stake is firmly driven into the earth; on the top of this stake is an iron peg, on which the guage or compasses of the moulder revolves; the stake is surrounded, at the lower end, with solid brickwork. This is called the *millstone.* A great portion of the space to be occupied by the core is filled up with bricks and earth, a hollow chamber being left in the centre, into which in a subsequent part of the process, hot coals are introduced for the purpose of drying the mould. This rough foundation is afterwards covered with successive layers of fine cohesive earth and sand, mixed with horse or hog's dung, the compasses being frequently applied for the purpose of ascertaining the progress of the work, and a moulding-board used to preserve the correct curve. At intervals, as the work proceeds, the mould is frequently dried, and any imperfections which may arise from shrinking are corrected by the moulder, by the addition of fresh compost; and the core is again dried and carefully smoothed over.

The core being complete, the *model* of the bell itself is next formed, by a composition of moulding loam and hair, which is applied to the core by layers, the last being very thin; the last layer is a mixture of wax and grease. The model being thus complete, the *shell* of the mould is formed; the first layer of this last coating is composed of earth, sifted

* See *Saturday Magazine*, Vol. III., p. 7, for a description of this monstrous bell.

very fine, and mixed with cow-hair, to make it adhere, and tempered with water to a state of semi-fluidity, when it is poured upon the waxen mould, and readily adapts itself to all its parts, filling in the ornaments, or writing, with which it is marked.

Two or three of these coatings having been applied, a fire is again lighted in the core, by which the shell is dried, and the wax, leaving its impression in the sand, melted off. After this other layers of the moulding loam are laid on, a quantity of hemp being spread intermediately, to bind the mass more securely together; the compasses are still employed, in order to secure a degree of equality in the thickness of the shell.

When the moulding is completed, and all the parts sufficiently dry, the hollow of the core is filled with sand, through an opening left at the head of the shell. Five or six pieces of wood, two or three feet long, are placed about the mill-stone, and under the lower part of the *shell*; between these and the *mould*, wooden wedges are driven to loosen the *model* and the shell, the latter being lifted off, and the former broken and removed from the core: the shell, after being blackened inside by the burning of straw, to give smoothness to the casting, is lowered exactly over the core; the cap containing the perforations for the rings or ears is affixed, and cuts are made for the escape of air, and admission of the metal, after which the whole is carefully surrounded in the pit with sand, well rammed about the shell. A gutter being made from the furnace, along which the metal, when in a state of fusion, is allowed to flow into the mould in the pit, until it has filled every part.

MOULDING A LARGE BELL

In Germany, and other parts of the Continent, the casting of a large bell is celebrated as a holiday by all the neighbourhood of the foundry, and is attended with much ceremony. The following extracts are from Lord Leveson Gower's translation of the celebrated "Song of the Bell," of Schiller. We have already alluded to this poem in the *Saturday Magazine*, and now add a more lengthened extract, embracing the whole of the descriptive part of the subject.

Through yonder clay at close of day
The molten mass shall run,
The fashioned bell itself shall tell
Our weary task is done.
Choose me splinters of the pine,
Choose them clean and dry
That the spiry flame may shine
Up the tube on high.
Pour the molten copper in,
Mix it with the bubbling tin,
That the viscous mass may flow,
Duly through the mouth below.

That offspring of consuming fire,
And man's creative hand,
High from the summit of the spire,
Shall murmur o'er the land.
Like flattery's voice, from yonder tower
Shall speak the genius of the hour,—
Shall bid the sons of mirth be glad,
Shall tell of sorrow to the sad,
Reflection to the wise;
Shall add to superstitious fear,
And peal on rapt devotion's ear
The sounds of Paradise.
And all his changeful fate brings down
On suffering man below,
Shall murmur from its metal crown,
Or be it joy or woe.

* * * *

Browner see the mass appearing;
Now the rod I dip within—
Should it glaze it, close adhering,
We may then our work begin.
Come pour the tide,
And be it tried,
To know if yet with favouring sign,
The ruder and the weak combine.

* * * *

Lift the liberating latch,
Free the metals on their way,—
First a hasty moment snatch,
Heaven's protecting aid to pray!
Strike the stopper! out it goes,—
Heaven protect us!—now it flows.
Shooting, sparkling through the mould,
Now the fluid mass has rolled.

* * * *

Through the moulded chambers gliding,
Now the metal fills the soil;
May the fashioned mass, subsiding,
Prove deserving of our toil.

* * * *

Short repose, an instant courting,
Till the bell has cooled, we rest——
Like the bird in groves disporting,
Each may play as likes him best.

* * * *

Break me down the mighty mould,
It has reached its master's aim,
Let the longing eye behold
The created child of flame.
Break it down, though strong it fit,
Swing the hammer till it split.
Would we raise the living bell,
We must break its mortal shell.
The master knows the time to shiver
The moulded form with cunning hand—

* * * *

Lo from the clay asunder parting,
Untarnished by the lapse of years,
Rays of metallic lustre darting,
All freshly bright the bell appears.

* * * *

Come, close your ranks, your counsel tell,
To bless and consecrate the bell—
CONCORDIAS' name may suit it well,
And wide may it extend the call
Of union and of peace to all;—
Such then be its solemn name,
And this its object and its aim.

* * * *

And now, with many a rope suspending,
Come, swing the monarch's weight on high,
By our last toil, its throne ascending,
To rule the azure canopy.
Stretch the pulley—now he springs!
Yet another—now he swings!
Let him bid the land rejoice—
Peace be on his earliest voice!

THE most necessary talent of a man of conversation, is a good judgment. He that has this in perfection is master of his companion, without letting him see it; and has the same advantage over men of any other qualifications what soever, as one that can see would have over a blind man of ten times his strength.—STEELE.

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THE CASTLE OF HEIDELBERG.

COURT-YARD OF HEIDELBERG CASTLE.

ALTHOUGH a brief account of the Castle of Heidelberg has already appeared in this work*, yet the great beauty, both picturesque and architectural, of this far-famed ruin, and its long period of historical importance, authorize the insertion of a further description; which, being chiefly drawn from the ancient archives of the place, will embrace a summary of its entire history.

In order to commence from the earliest known date, we must relate that the appellation *Heidelberg Castle* was originally borne by a fortress situated about half a mile above the present magnificent structure, which, both according to tradition, and the nature of the foundations still visible, was built by the Romans as a defence against the native hordes infesting the valley of the Neckar. They were further protected by a wall leading from this fortress down to the river, which, terminating in a tower, controlled any attack by water. This tower, with a portion of the wall, are still discernible in an old building called the *Marstall*, now used as a lying-in hospital. After the retreat of the Romans, from Germany, this upper fortress was maintained as stronghold, and subsequently became the residence of the earlier *Pfalzgrafen*, or Palatinate Counts. The first historical notice of these potentates, which can be safely quoted, relates that Conrad von Hohenstaufen, (born 1127,) Duke of Suabia, and half-brother of Frederic Barbarossa, Emperor of Germany, resided at this fortress, which we will distinguish as the *old* Castle, and possessing large estates on the Rhine, was created by his brother Pfalzgraf of the Rhine. He added largely to the Castle, built the Benedictine monastery at Schönau, and converted a cloister of the same order, situated at Neuburg, about a mile up the Neckar, into a convent for ladies of rank. (This building still exists under its original name of the *Stift Neuburg*, and is occupied as a Summer residence by a gentleman of large fortune.)

Conrad died at Heidelberg, 1195, leaving an only daughter Agnes, who married Henry of Brunswick, to whom devolved the government. By her he had two children, Henry and Agnes, and residing chiefly on his patrimonial lands, in no way contributed to the prosperity of Heidelberg. His son and successor survived him but three years, dying childless at the age of twenty. Upon this event the Emperor, Frederic the Second, (the Emperors of Germany having, in those times, the arbitration of such matters, and appointing and deposing the lesser powers as they pleased,) nominated Louis the First of Bavaria, of the house of Wittelsbach, successor to the Palatinate lands. The people, however, resisted this choice, took their appointed sovereign prisoner, and only released him at a high ransom. By a marriage of policy between Otho, son of Louis, and Agnes, daughter of the late count, matters were seemingly adjusted, and Louis permitted to reside in comparative peace at the old Castle, but his bloody murder, which

* See *Saturday Magazine*, Vol. III., p. 139.

took place six years later, in 1231, proves that there were still powerful malcontents around him. His son Otho succeeding, the hereditary line was continued. This prince is the first whom we find styled Pfalzgraf and *Churfürst*—a title derived from the old German word *kuren*, to choose, and *fürst*, a prince, and borne as a distinction by those reigning sovereigns who possessed the privilege of electing the emperors of Germany; we render it fitly by the term *Elector*. Otho united the Palatinate and Bavarian estates, purchased additional lands, and is supposed to have laid the foundation of the lower Castle, of which this account especially treats.

This splendid structure stands upon a platform of rock about three hundred feet above the river, originally called the *Jettenbühl*; from a tradition of one *Jetta*, a heathen prophetess who dwelt in a chapel upon this site, and to whom, being in high repute for her miracles and oracles, the people flocked from all countries. This personage was seldom visible, but the prophetic words emanated from a window of the chapel, and were caught by the crowd assembled beneath. One of her prophecies which have been handed down to the present generation, testifies that palaces in which kings should reside, should cover her lowly hill, and that numerous buildings should occupy the valley beneath. And truly, if all her peeps into futurity proved as clear-sighted, she duly earned her reputation. Further, the tale goes, that having wandered one day through the woods till she reached a certain fountain, and a cloud, we conclude, being drawn over her prophetic vision, she was surprised by a savage she-wolf, who quickly put an end to the prophetess of the Jettenbühl. The scene of this tragic event still bears the name of the *Wolfsbrunnen*, or Wolf's Fountain. It lies in a picturesque hollow about a mile from the town, and is to this day resorted to, without any apprehension of a similar fate, by the youth and beauty of Heidelberg.

But to return to the *Pfalzgrafen*. To Otho succeeded Louis the Severe, who, in his connubial transactions, somewhat resembled our Henry the Eighth, having married three wives, one of whom he beheaded. This count dying in 1295, was succeeded by his son Rudolph the First, whose administration is marked as a period of much suffering to the Castle and surrounding dominions. He was driven from his possessions by the Emperor Albert, and is supposed to have died in Austria. The succession, nevertheless, was bestowed upon his son, Adolphus the Simple, who, preferring a life of indolence to the government of broad lands, surrendered the sceptre to his brother Rudolph the Second, not, however, till he had restored the Castle to a habitable condition. Tenth on the line of succession now appears Rupert the First, brother of Rudolph, born 1309, whose name is conspicuous as the author of numerous benefits to the country, and especially as the founder of the Heidelberg university, whose flourishing schools still remain a monument of his enlightened liberality. He it was who first resided regularly at Heidelberg, and added largely to both town and Castle. He died without issue at the advanced age of eighty-one, and the government devolved upon Rupert the Second, son of Adolphus the Simple, who, however, seems to have inherited less of his father's than of his uncle's nature, for we find him seeking the advancement of his people, driving the Jews out of the town, an act considered meritorious in those times, and presenting thirteen of the deserted houses to the university. This Pfalzgraf was succeeded, after a reign of eight years, by his son Rupert the Third, elected, in 1400, King of Rome, and crowned as such at Cologne, in 1401. He built that part of the Castle called to this day the Rupert building, and which forms one of the most ancient and picturesque portions still remaining. In his regal capacity he resided chiefly at Oppenheim, but was buried at Heidelberg, having equally divided the Palatinate lands among his four sons.

Louis the Third, the Bearded, or Pious, received, as eldest son, Heidelberg for his portion, and may be considered as the founder of the Heidelberg line. He married in 1402, Blanche, daughter of Henry the Fourth of England; the first connexion of this state with our country, to which it has subsequently been so vitally allied. In 1414 and 1417, Louis attended the church convocations at Constance, where John the Twenty-second, the deposed Pope, was committed to his charge, and confined for some time at Heidelberg, and ultimately at Manheim. This Prince contributed much to the progress of the university and improvement of the Castle and town. He completed the fine church of the Holy Ghost in the market-place, which had been commenced under Rupert the First, and dying in his sixtieth year, was interred within its walls. To him succeeded his son Louis the Fourth, who becoming entangled in some petty wars, died, it is said, of chagrin, in his thirtieth year, leaving an only son, Philip, in the cradle. His brother, Frederic the First, surnamed the Conqueror, was appointed regent to the infant prince, and subsequently reigned conjointly with him. In those times the law of primogeniture was but partially enforced, and in several instances we find brothers wielding the Palatinate sceptre together. Frederic was an excellent Regent; he strengthened and enlarged the Castle, and although engaged in a succession of wars, contrived that they should all conduce to the prosperity and aggrandizement of his states. He was connected in a left-handed marriage with the beautiful Clara Dettin, of Augsburg, and dying in 1476, was buried by his own desire in the dress of a monk, in a Carmelite Cloister he had founded at Heidelberg; leaving Philip the First, or the Sincere, to govern alone. This prince united to a chivalrous nature, a great taste for the politer arts. By his summons, many of the literati of that period resorted to his court, and were detained in the service of the university.

In the year 1484, a high tournament was held in the great court of the Castle, to which all the titled and gentle blood, far and near, were bidden. This period calls forth all our liveliest conceptions of chivalrous magnificence, and never, perhaps, was this lordly Castle worthier tenanted than in good Count Philip's time. Tradition still tells of the valour of the knights, the beauty of the dames, and the wine and wassail which flowed around; and, although the great tun * was not then in being, there was, doubtless, as little lack of mouths to drain, as of vessels to contain the produce of the Neckar vineyards. A few years later, the Emperor Maximilian honoured this Pfalzgraf with a visit, and was received with all the pomp of the times. About this period, also, as the story goes, a pike was caught in the royal ponds at Kaiserslautern, weighing 350 lbs. From an inscription upon a ring round its neck, it appeared that it had been placed there in 1230, by the Emperor Frederic the Second; having thus enjoyed the good things of this life during an interval of 267 years and upwards. This is, fortunately, the only instance on record of a fresh-water fish of these majestic dimensions, otherwise a race of sharks weighing twenty-five stone, might have been rather an awkward addition to our annals of natural history.

* See *Saturday Magazine*, Vol. III., p. 140.

JOHN W. PARKER, Printer, West Strand, London.

In spite of the hospitality which had been shown to the Emperor, Count Philip was not secured from hostilities; for a year later, on his claiming the Bavarian succession for his son, Maximilian declared him under the ban, and sent a numerous army against the Palatinate. Both the town and Castle, however, were so well manned and fortified, and the inhabitants so devoted to their count, that the enemy only caused a temporary annoyance, and soon evacuated the land. Philip died 1508, and was buried in the church of the Holy Ghost.

Louis the Fifth succeeded to the government, and pursued his father's plans of improvement. He encouraged learning, protected the university, and greatly added to the size and strength of the Castle. He it was who commenced that formidable bulwark round the entire building, part of which, towards the west, is still standing, a monument of strength. Besides this, the so called Thick-tower, overlooking the town, of which only a section now remains; the square-tower, still in good preservation, the bridge, the bridge-house, the Stückgarten, &c., &c., were all erections of his reign. In 1524, this Elector proclaimed a trial of cross-bow shooting, at which many German potentates attended. This, however, appears the pretext rather than the object of their meeting; which was, in reality, to concert some means of arresting the progress of those intestine or peasant wars, which at that time ravaged Germany. In 1537, we read of a tremendous thunderstorm which broke over Heidelberg, when the lightning striking the older Castle above, which had been maintained merely as a fortress and magazine for powder, the whole structure was rent into the air, with an explosion audible for miles around. Nor did the damage end here, for the huge masses of masonry falling on the town and Castle beneath, crushed whole buildings, and occasioned much loss of life and property.

Louis the Fifth, dying 1544, was buried in the church of the Holy Ghost, and succeeded by his brother, Frederic the Second. This prince, although he had blamed his predecessor for his expensive love of building, continued, nevertheless, the improvements on a large scale; and among other additions, raised the octagon-tower, which still forms one of the most beautiful features of the ruin. He rendered great services to the Emperor, and was permitted in requital, to bear the Reich's Apfel or imperial crown in his arms, which, after this date, repeatedly occurs in the escutcheons about the Castle. Frederic appears to have been a gay bachelor; he always purposed marrying into some royal family, and for this end entered into successive negotiations with different courts, but did not finally take upon himself the yoke of matrimony till he had completed his 50th year, when his choice fell on Dorothea, daughter of the deposed king of Sweden, by whom he had no children. He died in 1556, and was buried with his forefathers. With him expired the Heidelberg line, and we can discover no connexion either immediate or collateral, with Otho Henry, of the house of Neuburg, who succeeded to the Palatinate states.

This prince, although bound by no hereditary ties, proved an excellent parent to his newly acquired dominions, and by the height of architectural splendour to which he raised the Castle, has established a claim on the reverence of all artists and antiquarians. Having, during his youth, visited the Holy Land, and collected a number of Greek and Arabian manuscripts, he presented them to the university, and thereby founded the famous library which was subsequently nearly destroyed during the thirty years war. During his travels in Italy he also cultivated his taste for architecture; and being furnished with designs from Raphael and Julio Romano, applied them in the erection of that splendid portion, called to this day, Otho Henry's building. This forms the west side of the Tournament Court, and contains the *Ritter Saal*, or Knight's Hall, and a princely suite of apartments, the façade of which, adorned with colossal figures from Scripture and Pagan history, offers a unique specimen of the florid and gorgeous architecture of those times. All these improvements were effected in the marvellously short space of three years, for we find the death of this spirited sovereign recorded in 1559, who dying without issue, the states devolved to Frederic the Third, of the house of Simmern, also connected by no consanguinity that we can discover, either with his immediate or more remote predecessors.

This Prince introduced the Calvinistic doctrines in opposition to those of Luther, which is the first mention we have obtained of religious disputes in the history of the Palatinate. His controversial occupations, probably left him no time for more secular pursuits,—at any rate we perceive no additions or alterations to the Castle recorded in this reign. He died in 1576, and was buried in the church of the Holy Ghost, succeeded by his son Louis the Sixth, who differing on doctrinal points from his father, revived the religion of Luther, and dismissed the entire Calvinistic court. This Elector also appears to have left the Castle as he found it, and dying in 1583, was gathered to his forefathers. He left a young son, but was succeeded by his brother, John Casimir, styled Pfalzgraf and Administrator, who officiated as Regent to the young prince. This former is celebrated as the founder of the first great tun, and of the building containing it. A small chapel in the upper part communicated with the cellar below, a circumstance which savours somewhat of the monkish habits of his predecessors. In this reign, the doctrines of these two reformers again changed places, John Casimir being a zealous disciple of Calvin, and again the court and state were cleared of all obnoxious dependants.

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY.

No. VI.

The Establishment of the Israelites in the Land of Goshen.

The Egyptians had long been exposed to the ravages of the wandering tribes, who possessed the Arabian peninsula, and who were sometimes robbers and sometimes merchants. Though commercial intercourse was maintained with these tribes, as we found exemplified in the history of Joseph, who was brought into Egypt by one of their mercantile caravans, yet they were always viewed with jealousy and suspicion. When the brethren of Joseph, therefore, came down to Egypt for the purchase of corn, it was by no means an improbable charge to accuse them of being spies, come "to see the nakedness of the land." *Nakedness* here does not allude to the barrenness produced by the seven years of famine, but to the want of natural or artificial defences on the eastern frontier of Egypt, through which most invaders have entered that land from the days of the Hycsos down to those of the Ayubite sultans. Though the sons of Israel denied the charge, we find that they did not deem it improbable or unnatural, for they refute it by showing that they did not belong to a wandering tribe, but to a stationary family. "Thy

servants are twelve brethren, the sons of one man in the land of Canaan." (Gen. XLii. 13). And Joseph's proof of their integrity, "send one of you, and let him fetch your brother," manifestly shows that it was a means of determining whether they were wanderers, like the Hycsos, or settled, and, therefore, peaceful agriculturists.

Now the monuments abound with proofs that such suspicions were not unfounded, for they exhibit the Egyptians as engaged in constant war with the predatory tribes on their eastern frontier, and the cruelty with which the captives were treated, proves that the hostility engendered by these wars was more deep and deadly than was usual, even in the most savage feuds of other nations.

We find indeed that the Egyptians extended their hatred of the wandering races even to the innocent; when the honesty and amicable disposition of the children of Israel were so fully recognised, that they were invited to dine with the prime minister, we find it recorded that "the Egyptians would not eat bread with the Hebrews, for that is an abomination to the Egyptians." This passage serves to explain a circumstance which has been the cause of much controversy among the commentators,—the reason why the descendants of Abraham were named Hebrews. Some assert that they were thus called from Heber, one of their ancestors,—an untenable hypothesis, as there is no circumstance recorded respecting Heber, which would entitle him to give his name to a tribe; others, with more probability, derive the name from a Hebrew verb, which signifies "to pass over;" but they restrict the allusion to Abraham's having "passed over" the Euphrates, when he came from the land of his fathers to dwell in Canaan. But since the word Hebrew signifies "a passenger," it is evident that it may be received as a designation of the wandering and pastoral life of the early patriarch. Abraham, Isaac, and Jacob were "dwellers in tents," not inhabitants of cities; the Egyptians had no cause for hating the descendants of Heber, or the offspring of any one who had come from beyond the Euphrates, but they had every reason to detest nomades, or wanderers, and the very name of Hebrew intimated that those so called led a wandering life.

The circumstances of the entertainment given by Joseph to his brethren, can only be understood by a reference to the oriental customs at feasts, which have varied very little since the days of the Pharaohs. The guests did not, as with us, sit down to the same table, but a separate tray or table was provided for every two, or at most every three guests, from

AN ALTAR-TABLE, WITH FOWLS, BREAD, FRUITS, &c.

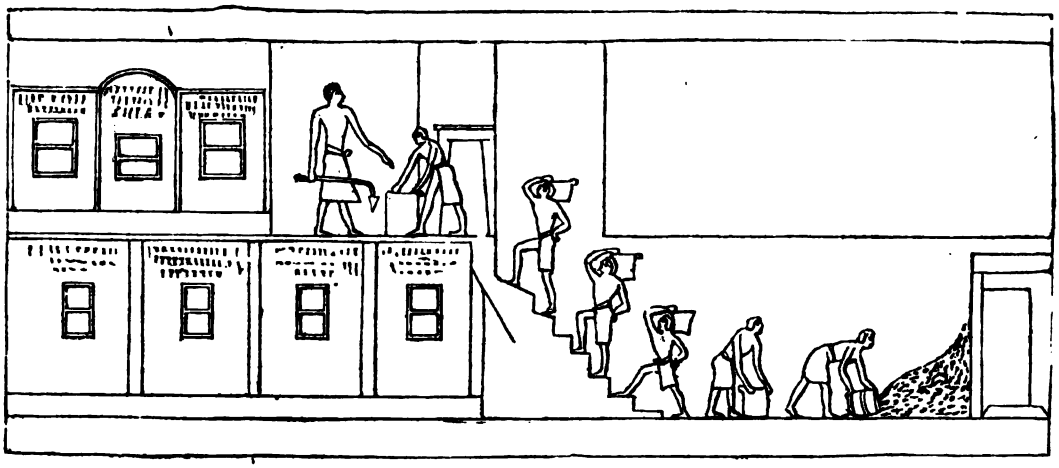
which they furnished themselves, without paying any attention to their neighbours. It was a distinguished mark of honour to give some eminent guest a tray or table to himself. There are even now no removes or changes of courses at these entertainments; all the viands are piled together on the tray or table, and the number, variety, and delicacy of the dishes are usually proportioned to the rank of the guest.

Hereafter we shall have occasion to notice, that a similar plan was followed in making offerings to the gods; indeed, it is exceedingly probable, that the Egyptians derived their first notion of an altar from the banquetting tables of their kings and princes.

This custom of ranging separate trays or tables for groups of guests, greatly facilitated the arrangement of the company according to rank, a circumstance to which the orientals have ever attributed considerable importance. In the narrative of the entertainment given by Joseph to his brethren, we are told "they sat before him, the first-born according to his birth-right, and the youngest according to his youth; and the men marvelled one at another." (Gen. XLiii. 33). Their surprise was occasioned not by the circumstance of seeing a distinction made, but by the accuracy with which they were arranged in their proper order, as they supposed there were no means of determining their relative seniority. A similar circumstance occurs in an ancient Chinese tale, where the order in which an apparent stranger salutes the members of his family, leads to the discovery of his identity. Benjamin's portion was probably served on a separate tray or table; we are told that "his mess was five times so much as that of any of his brethren;" whence some persons have very absurdly inferred, that he ate five times so much as they did, which, of course, would be impossible, unless they were very niggardly supplied; but from what we have already said, the meaning is clear, the expression simply indicates that a greater variety of delicacies were offered for his selection.

The monuments show us that, in the very earliest ages, Egyptian luxury had led to the invention of countless forms of pastry and confectionary, as we had occasion to remark in noticing the history of Pharaoh's baker.

When his brethren were about to depart, Joseph directed his steward to conceal his silver-cup in the sack of Benjamin. We have more than once noticed the early use of ornaments formed from the precious metals among the Egyptians; extraordinary attention was paid to the form and decorations of their drinking cups, and we find that some of the richest tributes which the Pharaohs received from the southern provinces, especially Meroe and Nubia, were gold and siver vases. Joseph's steward declares that this cup was not only used for drinking, but also for divination. "Is not this it in which my lord drinketh, and whereby indeed he divineth?" (Genesis XLiv. 5.) Divination by the cup is only one form of the divination by a fluid mirror, which, from the earliest ages, has prevailed in the East, and which, after the Crusades, became a popular form of witchcraft in modern Europe. Indeed, the credulous and ignorant in some of the remoter districts of England, still believe that fortune-tellers can predict future events by inspecting the accidental arrangement of the grounds in a tea-cup or a coffee-cup. We cannot identify this form of divination on the monuments, but the most ancient traditions bear testimony to its prevalence; one of these intimates that those who conjure indiscreetly with the magic cup expose themselves to great danger, and it is possible that the circumstance was mentioned in order to terrify the sons of Jacob. It must be recollected, too, that it is Joseph's steward, not Joseph himself, who speaks of conjuring with the cup.



STORING THE CORN IN THE ROYAL GRANARIES.

After Joseph made himself known to his brethren, he sent "wagons" to bring his father and family down into Egypt; it appears that such vehicles were unknown, or, at least, uncommon, for the moment that Jacob saw them, he recognised the land from which they came. On the monuments, the only wheel-carriages usually seen, are the war-chariots; but it is manifest that the use of these conveyances must have led to the employment of wagons and similar vehicles for the transport not only of goods, but of women, children, and sick persons. Indeed, Joseph expressly intimates that such was the use for which these vehicles were intended. "Take you wagons out of the land of Egypt, for your little ones and for your wives." (Gen. xlv. 19.) Within a very recent period the representation of a four-wheel vehicle, extremely like a farming wagon, or wain, has been discovered among the paintings in a tomb, at Thebes, wherein the mummy of a person of high rank was found.

The policy which induced the reigning Pharaoh to give the land of Goshen to the colony of the Israelites, may readily be understood by a reference to the map of Egypt, and to what we have already said respecting the inveterate hostility between the Egyptians and the wandering tribes of Arabia and Syria. Goshen was the name of the rich pasturage districts between the eastern bank of the Nile, and the upper shores of the Red Sea. It was a frontier province exposed to the ravages of the Arabians and Syrians, and was almost useless to the Egyptians, whose habits and customs were utterly at variance with the usages of a nomade life. When we read that "every shepherd is an abomination to the Egyptians," (Gen. xlvi. 34,) we must not imagine with many commentators that they had any religious objection to the mere occupation of tending flocks and herds; indeed, so far was this from being the case, that we find an entire caste of herdsmen among the Egyptians, and flocks of sheep and goats, droves of black cattle, and herds of other tamed animals are frequently depicted on the monuments. The prejudice was against those restless tribes, from whose incursions they suffered so severely, and they probably feared that, if any native Egyptians settled in Goshen, they might gradually acquire a taste for a wandering life, and, perhaps, in the end, favour an invasion.

This enmity between agricultural and pastoral populations brought into close contact, is still exemplified on the north-eastern frontiers of Persia. Nothing can exceed the mutual contempt and rancorous hatred between the Turcomans and Tartars, who lead a nomadic life in the steppes and deserts north of the Oxus, and the settled agriculturists of Persia. They speak of each other with a virulence and affected contempt which could only have been engendered by centuries of mutual hatred and mutual injury. But with the Egyptians this natural enmity was systematized by the exertions of the priestly caste, who sanctified policy by religion, and forbade their followers even to partake of a social meal with the objects of their jealousy and their animosity.

The defenceless land of Goshen was, therefore, worse than useless to the Egyptians; it was the high road for the invasion of the pastoral tribes with whom, then, as now, a foray was esteemed an honourable enterprize, and it could not well be used as pasture, for the Egyptians employed to tend cattle in that region must have, in some degree, adopted the usages of their enemies. This sufficiently appears from the words which Pharaoh addressed to Joseph, "if thou knowest any men of activity among them, then make them rulers over my cattle." (Gen. xlvii. 6.) The Hebrew words translated "men of activity," more properly signify "men of military habits," such as the Israelites were likely to acquire by a nomade life, and of which they were certain to need the exercise in guarding the royal herds of a frontier province.

The policy of Pharaoh is now intelligible; as Dr. Hales very properly remarks, "Goshen formed the eastern barrier of Egypt towards Syria and Palestine —the quarters from which they most dreaded invasion—whose *nakedness* was now covered in a short time, by a numerous, a brave, and an industrious people: amply repaying, by the additional security and resources which they gave to Egypt, their hospitable reception and naturalization." And thus Joseph, while he provided for the comfort of his family, conferred an inestimable advantage on the monarch whom he served.

Two years of the famine alone had expired when Jacob and his posterity came down to colonize the land of Goshen. Five years yet remained during which the Egyptians had no resources but the royal granaries, which had been amply stored by the provident care of Joseph during the seven years of plenty. Nor is there any difficulty in supposing that the granaries could contain a sufficient supply for the entire population of Egypt during the space of seven years. The monuments contain ample proofs of the care that the Egyptians bestowed on the storing and preservation of corn, and the great extent of their granaries.

Some persons, indeed, have insinuated rather than expressed a doubt, of the possibility of preserving corn for so long a time; but in a climate so remarkably dry as that of Egypt, there is no limit to the period during which grain may be kept sound We

have seen some grains and seeds taken out of the sepulchres, which were so far from being injured by being kept for three thousand years, that they still retained their germinating power, and we have actually seen a plant grown from one of them.

It was Joseph's policy to make the sovereign lord of the soil of Egypt, with the single exception of the land belonging to the priests. Hence the rental of Egypt was identical with its taxation; the sum paid for the support of the government being twenty per cent, or one-fifth of the entire produce. The existence of this singular system is confirmed by the monuments, for we find a superintending secretary present at the winnowing and measuring of the corn, as was shown in an earlier part of this series.

Both Jacob and Joseph were embalmed after their death, the body of the former was immediately removed to the land of Canaan, but Joseph's remains were not borne to the sepulchre of his fathers, until the Israelites entered the land of Canaan, after their departure from Egypt and wanderings in the desert. It is unnecessary to dwell upon the care with which the Egyptians preserved their dead; the mummies are too well known to require description. There are, however, one or two circumstances mentioned in the Scripture narrative which require a few brief observations. When the Israelites had brought Jacob's body over the river Jordan, they made a halt for seven days to indulge their sorrow, "and when the inhabitants of the land, the Canaanites, saw the mourning in the floor of Atad, they said, This is a grievous mourning to the Egyptians; wherefore the name of it was called Abel-mizraim, (*sorrow of the Egyptians*,) which is beyond Jordan." (Gen. L. 11.) In confirmation of this narrative, we find that no nation, ancient or modern, carried their lamentations for the dead to such an extravagant length as the Egyptians. We see the mourners at funerals depicted on the monuments rending their garments, casting dust upon their heads, beating their breasts, and using gestures that seem to belong to almost hopeless despair. Historians assure us, that during the period of mourning, which varied with the rank of the deceased, the relatives and dependents abstained from the use of meat and wine, neglected their persons, and went about singing plaintive songs in honour of the departed. The Israelites adopted this custom, and it was retained by the Jews for many centuries after it had been disused in Egypt. But such a practice was looked upon as unmanly by warlike and nomade races, and hence arose the surprise of the Canaanites, who regarded such grief as so great a novelty, that they perpetuated its memory by giving a new name to the place in which it occurred.

It is particularly mentioned that Joseph "was put in a coffin;" among the Egyptians, coffins were used only in the burial of people of distinction; but when they were used, great care was taken in ornamenting and decorating them. The wood from which they were formed is of so lasting a nature, that some of those Egyptian coffins now to be seen in the British Museum, and other collections of antiquities, seem as fresh as if they had just come from the hand of the maker. Hence we see, that there was no very great difficulty in the children of Israel bearing with them the body of Joseph at the time of the Exodus, and carrying it about with them during their wanderings in the desert. It was not until the conquest of Canaan was completed, indeed, that the body of the patriarch was committed to its final resting place; for we read in the book of Joshua, "And the bones of Joseph, which the children of Israel brought up out of Egypt, buried they in Shechem, in a parcel of ground which Jacob bought of the sons of Hamor, the father of Shechem, for an hundred pieces of silver; and it became the inheritance of the sons of Joseph." (Josh. xxiv. 32.)

We have now gone minutely through the entire history of Joseph and his family, and have shown how fully every particular is confirmed by existing testimony, brought to light within our own day. We have next to investigate the history of the Israelites under altered circumstances, when "another king arose who knew not Joseph."

HISTORY OF WRITING MATERIALS.

THERE are few subjects capable of affording more interesting details than the history of the origin, progress, manufacture, and use of those articles or substances with which we are most familiar; and yet it happens that these are precisely the very subjects about which least is known. Whether the old adage that "too much familiarity breeds contempt," applies to a contempt for the knowledge of things familiar to us, we know not; but we certainly cannot understand the feeling which seeks for information respecting objects new and strange, and disdains to inquire into the many curious properties and useful facts concerning familiar things. The very circumstance of familiarity and utility ought, we think, to afford an additional reason for acquiring information concerning such articles. We propose, therefore, to lay before our readers the history of those familiar and useful articles—Writing Materials. Having already introduced cursory notices concerning some of them, more especially those of the ancients, our chief business will now be with those of the moderns.

I. THE HISTORY OF A QUILL PEN.

IT has been said, quaintly enough, that he who first introduced the use of goose-quills for pens, borrowed from the emblem of folly the instruments of wisdom. Without discussing the justice or injustice of this satire upon a poor goose, we cannot deny that quill pens have been the messengers of vast benefit to mankind, insomuch that it has been sarcastically remarked, that "had the ancients been acquainted with the art of employing quills as a material for pens, they would, probably, have dedicated to Minerva, —not the owl, but the goose." But some men have made the mistake of honouring the pen as the cause, instead of the mere instrument, of good. Thus, we have been told of one writer who had the pen with which he wrote one of his works, framed and glazed, and hung up over his mantel-piece; another pen was put into a golden casket by the over-zealous admirer of a celebrated writer; and no doubt it was with a feeling of much complacency and self-satisfaction that Holland, a physician of Coventry, who translated Pliny's *Natural History* into English, wrote the following lines:—

> With one sole pen I wrote this book,
> Made of a gray goose quill.
> A pen it was when it I took—
> A pen I leave it still.

It appears from the best testimony, that the mode of writing in the earliest times was not by the use of a fluid like ink, but by marking with a blunt point on tablets covered with a surface of wax; but when the Egyptian papyrus was devised, and a coloured liquid found, which could be used as ink, a new mode of procedure was devised, more likely to leave permanent traces of the writing. The instrument employed was a reed, the nature of which is not precisely

ascertained. Massey, in his *Treatise on the Origin of Letters*, mentions the use of reeds for writing among the Turks, Moors, and the oriental nations generally. The same author remarks, that whenever the word pen occurs in our English translation of the Old and New Testament, we must not understand it to mean a quill pen, but as an iron style or a reed, both of which the early nations used: the former was sharp at one end, like a pointed needle, and at the other end broad and blunt, to rub or scratch out what the writer wished to be erased.

Styles were much used among the Romans, they were made of different metals, also of ivory or bone. Wooden styles, or skewers, were found in the ink-horns at Herculaneum. The common material of styles was, however, iron; for we find that, as the Romans were not allowed to wear arms in the city, they often, in a fit of wrath, wounded each other with the writing-style, which they carried about them; hence the origin of the Italian *stiletto*. Respecting the reeds which were substituted for the blunt style and wax tablet, they are described as having been small, hard, round canes, about the size of a large swan's quill, and fashioned into shape much as we now do our quills. The supply of them used to be obtained chiefly from Egypt, Cairo, in Asia Minor, and Armenia. Chardin and Tournefort have described in their travels a sort of reed employed for this purpose, which grows in Persia, and which they considered as the best, at that time. These reeds are not originally hollow, but contain a pith, which, however, afterwards dries up in a manner similar to the membranous film in the barrels of our modern quills. These reeds are collected in some places bordering on the Persian Gulf, whence they are sent to every part of the East. They are said to be deposited for some months after they are cut, under a dung-hill, when they assume a mixed black and yellow colour, acquire a fine polish and a considerable degree of hardness; this latter quality, however, is rendered of less value, by the circumstance that it is accompanied with a want of that elasticity which is so valuable a property in quill pens. This we can easily conceive, for although bamboo-reeds, and canes, are, in general, elastic in their complete form, yet when they are deprived of the internal parts by drying or any other process, the shell, or cylinder, is not likely to have much elastic property remaining.

Thus much for reed-pens, our information on which is but limited. Concerning quills, much doubt exists as to when they were first applied to the purposes of pens. An anonymous historian of Constantius says that they were so employed in the fifth century; but the oldest certain account is said to be a passage in some writings of Isidore, who died in the year 636; and who, in an enumeration of the materials used in writing, mentions reeds and feathers. There exists, also, a poem "on a pen," written in the same century, and to be found in the works of Adhelinus, who died in 709, and who was the first Saxon who wrote in Latin. We supply the following translation.

CONCERNING THE PEN OF THE WRITER.

The shining-white pelican (bittern) which sips with open throat,
The waters of the pool once produced one white.
I proceed direct to the whitening plains
And leave *blue marks on the shining-white ground**,
Shadowing the glistening grounds with *darkened windings* †.
Nor is it enough to *open a track over the plains* ‡;
But rather a path continues by numerous turns
Which has carried to the heights of Heaven, those who wander not.

* Blue ink upon white paper. † Letters.
‡ Nor is it enough merely to scribble.

Strutt gives the annexed representation of the Anglo-Saxon pen and inkstand.

Another writer of the fifth century, quoted by Adrian de Valois, has been considered as affording proof of the use of quill pens at that time, by the following statement:—That Theodoric, King of the Ostrogoths, was so illiterate and stupid, that during the ten years of his reign he was not able to write five letters (THEOD) at the bottom of his edicts. For this reason the letters were cut for him, (we may suppose like our modern stencil plates,) in a plate of gold, and the plate being laid upon the paper, he then traced out the letters with a pen. The Emperor Justin, who flourished about the same period, is said to have shown a similar specimen of ignorance. Alquin, the friend and teacher of Charlemagne, mentions writing pens in the eighth century. After that time, proofs exist which put the question of their use beyond dispute. Mabillon saw a manuscript Gospel of the ninth century, in which the evangelists were represented with pens in their hands. *Calami* properly signify the reeds used by the ancients in writing; but modern authors have often used the term as a Latin word for pen, and it has been suggested that that was probably the proper term for quills, before their application to the purposes of pens. Reeds were used for a considerable time after the introduction of pens; and in monasteries and convents were frequently used for initial letters, as they made stronger marks than quills. By some letters of Erasmus to Reuchlin, we learn that the latter sent three writing reeds to Erasmus, who expressed a wish that Reuchlin, when he could procure more, would send some to a learned friend of his in England. Erasmus lived between 1467 and 1536, and it would from this appear that quills were scarce at that time. About the period of 1430, the familiar letters of the learned men of Italy, made mention of two inconveniences to which they were subject at that time, viz.; the difficulty of making good ink, and the scarcity of good quills.

The principal birds from which quills have been obtained for making pens, are the goose, the swan, and the crow. Pelicans, and other birds, have also at different times, helped to furnish a portion of quills; but of all these, the goose has furnished by far the larger portion. So immense has become the number of quills employed, that in 1832, (notwithstanding the large consumption of steel pens,) thirty-three million, six hundred and sixty-eight thousand goose quills, were entered for home consumption, the greater part of which came from the Netherlands and Germany. An immense quantity is also imported from Russia and Poland, where vast flocks of geese are fed for the sake of their quills alone. The quantity exported from St. Petersburg varies from six to twenty-seven millions. We may form some idea of the number of geese which must be required to afford the supply, when we consider that each wing produces about five good quills, and that by proper management, a goose may afford twenty quills during the year. Hence, it is obvious, that the geese of Great Britain and Ireland could afford but a small supply.

The quills are the large feathers taken from the ends of the wing, and have different names according to the quality, which seem to depend principally on the part of the wing from which they are taken. The operation of preparing the quills is called quill-dressing, sometimes quill-*dutching*. The quills as they are taken from the bird, are covered with a

membranous skin, and have a toughness and softness which prevents their being easily split. They are also opaque, and the vascular membrane on the interior of the barrel adheres to it so strongly, that it is with difficulty detached. To remedy these defects, and to fit the quills for their destined purpose, is the business of the quill-dresser. He takes a large bundle of the quills, just as they are taken from the bird, and proceeds to separate them into three parcels,—differing from each other in the size and quality of the quills. The value is estimated both by the length and the thickness of the barrel; those having the largest and longest barrels being called "primes," which fetch the highest price in the market; the next best in quality are designated as "seconds," and the third, or smallest size, are called "pinions." The process of sorting being completed, the workmen proceed to "clarify" the quills, the principal object of which is to remove the membranous skin. The quills are plunged for a short time into heated sand: the heat of the sand makes the outer skin crack and peel off, which is further aided by scraping them with a sharp instrument; while, at the same time, the internal membrane becomes shrivelled up, and falls down to the point of the quill. The barrel of the quill is also hardened and rendered transparent by this process, in consequence of the heat consuming or drying up the oily matter resident in it. This latter effect is increased by repeated heatings; and when done for the purpose of hardening the quill, is called *dutching*, probably from the circumstance that the process was first adopted in Holland. (The term Dutch pens, is frequently applied to quills that have been passed through hot ashes, to remove the grosser fat and moisture, and to render them more transparent.) For the best pens, the process of dutching is repeated several times; but care is necessary, in order that the heating should not be carried so far as to injure the barrel. The quills after this process, are either of the colour of fine thin horn, or of an impure white; but before they are brought to market they undergo another process, with the two-fold object of giving them an uniform yellow colour, and to make them split more easily. They are dipped into diluted aquafortis or nitric acid, which has the effect desired. It is however thought by some, that this process, although it improves their beauty, injures their quality by making them too brittle, so that the slit is apt to run up on pressing with moderate firmness; for this reason, many persons who write much, such as clerks in mercantile houses, &c., frequently prefer a quill which has not undergone this process, as being more durable. The quills having been thus dressed and finished, a portion of the barb is stripped off, to occupy less room in packing, and the quills are tied up into bundles of twenty-five or fifty each, for the market.

The process of preparing the quills is, however, subject to some variation. Some dressers adopt the following mode. The quills are first moistened, not by immersion, but by dipping their extremities into water, and allowing the remaining parts to absorb moisture by capillary attraction. They are then heated in the fire or in a charcoal chaffer, and are passed quickly under an instrument with a fine edge, which flattens them in such a manner as to render them apparently useless. They are then scraped and again exposed to heat, whereby they assume their original form. This is a remarkable fact, and may be illustrated by taking a feather and crushing it with the hand so as to destroy it to all appearance; if we now expose it to the action of steam or a similar temperature, it will speedily assume its former condition.

Many of the quills after this preparation are cut into pens by means of the pen-cutter's knife, and are also trimmed. A pen-cutter will cut in a day two-thirds of a long thousand, consisting of 1200 according to the stationer's computation. A house in Shoe-Lane, London, cuts generally about 6,000,000 of pens yearly; and during the year 1834, notwithstanding the introduction of steel pens, it cut many more than it had done in any previous year. It is calculated by pen-makers, not more than one pen in ten is ever mended.

Swan-quills, which are very large in the barrel, are sometimes employed for pens, and though expensive at first, are, perhaps, not dearer ultimately than the smaller quills, their length and capacity of barrel compensating for the larger charge. Crow-quills are generally employed in drawing and designing, on account of the fine point to which they can be brought. They are particularly useful in that kind of etching which is intended to imitate prints. Quills may be hardened by steeping them in alum-water, at a boiling temperature for a few minutes.

There is a modern contrivance by which six or eight pens may be made out of one large quill. The narrow end, and also the stalk of the pen being cut off, leaving the barrel only remaining, the latter has a cylinder inserted through it, a little smaller than its own diameter. It is then placed in a machine in such a way that two cutting edges pass along the barrel, one on each side, by which the quill is cut longitudinally into two semi-cylindrical halves. These pieces are then placed in a groove with the convex side undermost, and the edges are made straight and smooth by having a plane run along them. These half-cylinders of quill are then cut into three or four pieces, according to their length, and each piece is operated on by the nibbing-machine, which is a sort of cutting press. A few strokes with a pen-knife then brings each little piece to the form of a pen, which, fixed in a handle, is fit for use.

THE VILLAGE CHURCH.

MINE be the rude and artless pile,
The ivy-mantled turret gray,
Within whose old unsculptured aisle,
The toil-worn peasant kneels to pray.
The whitened wall, the latticed pane,
The rustic porch, the oaken door;
Above, the rafters huge and plain,
Beneath, the footstep-graven floor.
Not here, where few could pomp admire,
The sons of wealth their pomp display;
They throng not here in gay attire,
Who come to gaze and not to pray:
No high-tuned choral peals surprise,
Enchanting fashion's languid train,
With arts ingenious to disguise
The bard of Sion's raptured strain.
But here, where lowly hearts are bowed,
By toil and sorrows gentler made,
Nor earth-born schemes, nor visions proud,
The unambitious breast invade;
More nearly is His Presence felt,
For whom the Heaven of Heaven expands
Its arch in vain, who never dwelt
In temples built by human hands.
By viewless Spirit of the air,
The soul's mysterious depths are stirred,
More fervent soars the heavenward prayer,
More deeply sinks the engrafted word:
O could my heart, in darker hour,
That calm and reverent mood recall,
How weak were then temptation's power
How frail the world's unhallowed thrall! R.

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QUEEN ELIZABETH; HER PROGRESSES AND PUBLIC PROCESSIONS. No. II.

PALACE OF PLACENTIA, AT GREENWICH, THE BIRTH-PLACE OF QUEEN ELIZABETH.

BIRTH AND CHILDHOOD OF ELIZABETH—DESCRIPTION OF THE ANCIENT PALACE OF GREENWICH.

BEFORE entering upon a description of the Progresses and public Processions of Elizabeth while she occupied the throne, we shall proceed to notice the more prominent events of her early life, which still serve to invest some localities with interesting associations. Concerning the periods of her childhood and youth, in the reigns of her father and brother, a few very interesting details have been handed down to us; while that part of her life which was spent under the rule of her sister Mary, possesses considerable importance in an historical point of view.

Elizabeth was born at the palace of Greenwich, on the 7th of September, 1533. Her mother, Anne Boleyn, or more properly, Bullen, the daughter of Sir Thomas Bullen, had been privately married to King Henry the Eighth, some time in the month of January of the same year; and on the 23rd of May, his previous marriage with Catherine of Arragon had been declared by Archbishop Cranmer, to have been from the beginning, null and invalid.

The birth of Elizabeth was the occasion of much joy; in the account of a contemporary chronicler, we have a very lively and interesting description of the ceremonies which attended her christening:—

The 7th of September being Sunday, between three and foure of the clocke at afternoone, the Queene was delivered of a faire ladie; for whose good deliverance *Te Deum* was sung incontinently, and great preparation was made for the christning. The maior, and his brethren, and fortie of the chief citizens, were commanded to be at the christning of the Wednesdaie following. Upon which daie, the maior, Sir Stephen Peacocke, in a gowne of crimosin velvet, with his collar of esses, and all the aldermen in scarlet with collars and chains, and all the councell of the cittie with them, tooke their barge at one of the clocke; and the citizens had another barge, and so rowed to Greenwich, where were many lords, knights, and gentlemen assembled. All the walles between the king's pallace and the Fryers were hanged with arras, and all the way strewed with greene rushes. The Fryers church was also hanged with rich arras; the font was of silver, and stoode in the midst of the church three steps high, which was covered with a fine cloth; and divers gentlemen with aprones and towels about their neckes, gave attendance about it, that no filth should come to the fonte; over it hung a square canopie of crimosin sattin fringed with golde; about it was a rayle, covered with a redde saie; between the queere and body of the church was a close place with a pan of fire to make the childe readie.

When all things had been thus arranged, the child was brought to the hall, and the procession set forward. First went the citizens two and two; then the gentlemen, esquires, and chaplains; "next after them, the aldermen and the maior alone, and next the kinges counsell; then the kinges chappel in coaps; then barons, bishops, earles." The earl of Essex,—the last of the Bourchiers who had that title,—bore the covered basons gilt; after him, with a taper of virgin wax, came the marquess of Exeter, who was put to death by Henry three years afterwards; then the marquess of Dorset, (the father of Lady Jane Grey,) with the salt, and behind him the Lady Mary of Norfolk "bearing the crisome, which was very rich of pearle and stone." The child was borne by the dowager duchess of Norfolk, in a mantle of purple velvet, with a long train furred with ermine. On the right of the duchess was the duke of Norfolk with his marshal's rod, and on her left the duke of Suffolk; before went officers of arms; and afterwards came the countess of Kent, and the earls of Wiltshire and Derby supporting the train. Over the child was a rich canopy, borne by the Lord Rochford, the Lord Hussey, the Lord William Howard, and the

Lord Thomas Howard the elder. And lastly, came many ladies and gentlemen.

When the childe was come to the church doore, the Byshop of London* met it with divers byshoppes and abbots mitered, and beganne the observances of the sacrament. The god-father was Lorde Thomas Archbyshoppe of Canterburie†; the god-mothers were the olde Dutchesse of Norfolk and the olde Marchionesse of Dorset, widdowes; and the child was named ELIZABETH: and after that all things were done at the church doore, the child was brought to the font and christned; and that done, Gartar chiefe king of armes cryed aloud, "God of his infinit goodnesse send prosperous life and long to the high and mighty princess of England, ELIZABETH!" And then the trumpets blew; then the childe was brought up to the altar and the Gospell said over it. After that, immediately the Archbyshop of Canterburie confirmed it, the Marchionesse of Excester being god-mother: then the Byshop of Canterburie gave unto the Princesse a standing cup of golde; the Dutchesse of Norfolke gave to her a standing cup of golde fretted with pearle; the Marchionesse of Dorset gave three gilt boles pounced with a cover; and the Marchionesse of Excester gave three standing boles graven all gilt with a cover. Then was brought in wafers, confects, and ipocrasse, in such plentie, that every man had as much as hee coulde desire: then they set forwarde, the trumpets afore going in the same order towards the Kinges pallace, as they did when they came thitherwarde, &c.

The mayor and aldermen received the King's thanks in his chamber through the dukes of Suffolk and Norfolk; "and from thence they were had to the seller, and dranke, and so went to their barge."

Elizabeth was not three years old when her mother was beheaded. It was on the 19th of May, 1536, that Queen Anne Boleyn was executed on the green before the Tower of London; the marriage of Henry the Eighth with Jane Seymour taking place on the next day. Very soon after the birth of Elizabeth, an Act of Parliament had been passed, declaring that if her mother should die, without leaving any male issue, the crown should descend, on the death of the king, to her and her heirs; thus the princess was placed in the order of succession, not only before the Princess Mary, the daughter of the degraded Queen Catharine, but likewise before even any male issue of the king by a future queen. This arrangement was speedily disturbed upon the death of Queen Anne Boleyn; an act being passed soon after the king's marriage with Jane Seymour, annulling his second marriage as well as his first, and consequently rendering the Princess Elizabeth, as well as the Princess Mary, incapable of succeeding to the crown, which it settled upon Henry's issue by Queen Jane or by any future wife whom he might marry.

After the execution of her ill-fated mother, the young Princess Elizabeth seems to have been greatly neglected by her father. Some very curious information concerning the condition to which she was then reduced, and the "ill case," to use Strype's expression, in which she was left, has been handed down to us in a letter printed by Sir Henry Ellis, in his second series of *Original Letters*. It is addressed by Lady Brian, the governess of the Lady Elizabeth, to Lord Cromwell, from Hunsdon, for instructions concerning her after the death of Queen Anne, her mother. After some preliminary remarks, the Lady Governess thus proceeds:—

My Lord, when my Lady Marys Grace was born, et pleased the King's Grace to appoint me Lady Mastres; and made me a Barones. And so I have been our . . . . . to the Cheldern hes Grace have had sens.

Now et es so my Lady Elizabethe is put from that degre she was afore: and what degree she is at now I know not bot be heryng say; therefor I know not how to order her nor my self, nor none of hers that I have the rewl of: that is her women and har gromes: besychyng yow to be good Lord to my Lady and to al hers: And that she may have som rayment; for she hath neither gown, nor kertel, nor petecot, nor no manner of linnin for smokes, nor cercheses, nor sleves, nor rayls, nor body-stychets, nor handcerchers, nor mofelers, nor begens. All thys har Graces Mostake, I have dreven of as long as I can, that be my trothe I cannot drive it no longer, besechyng yow, my Lord, that ye wel see that her Grace may have that is nedful for har, as my Trost es ye wel do. Beseeching yow, my owen good Lord, that I may know from yow be conting how I shal order my self; and what es the kyng's Graces pleser and yours, that I shal do in every thing. And whatsom ever it shall ples the kyng's Grace or your Ludship to command me at all teyms, I shal folfel et, to the best of my power.

There appears to have been some misunderstanding between the Lady Governess and one Mr. Shelton, who was chief of the house at Hunsdon. Lady Brian seems to press very strongly for the interference of Lord Cromwell.

My Lord, Mr. Shelton saythe he es Master of thys Hows; what fashion that shal be I cannot tel: for I have not sen et afor. My Lord, ye be so honourable your self, and every man reportethe your Lordsychep lovethe honour that I trust your Lordship will se thys Hows honerabely ordered, how som ever it hath been aforetime, and ef et plese yow, that I may know what your Order is, and if it be not performed, I shal sertify to your Lordship of it. For I fear me it wil be hardly inow performed, for ef the head of . . . . . knew what honour meaneth, et wel be the beter ordered: ef not it will be hard to bring it to pass.

The next paragraph of the letter displays strongly the anxiety of the "discreet lady Governess," as Strype calls her, for the health of her charge, and the extreme imprudence of Master Shelton in meddling with matters which did not concern him.

My Lord, Master Shelton wold have my Lady Elizabeth to dine and sup every day at the bord of Astat [board of estate.] Alas! my Lord, it is not meet for a child of har ag [her age], to kepe such rewl yet. I promes you, my Lord, I dare not take et upon me to kepe har Grace in helthe and she keep that rule: for ther she shal se dyvers mets and freuts, and wine: which would be hard for me to refryn her Grace from et. Ye know, my Lord, there is no place of corekcyon ther. And she es yet to young to correct greatly. I know wel, and she be ther I shal nother bryng her up to the king's graces honour nor hers; nor to har helthe nor my pore honesty. Wherfore I shew your Lordship this my descharg, besycheyng you, my Lord, that my Lady may have a mess of met to har owen logyng, with a good dish or two that is meet for her Grace to et of: and the reversion of the mess shal satisfy al her wemen, a gentleman usher and a groom. Which been eleven persons on her side. Suer I am et wil be (in to right little) as great profit to the king's Grace this way as the t'other way. For if al this should be set abroad, they must have three or four mess of meat, where this one mess shal suffice them al with bread and drink, according as my Lady Maries Grace had afore; and to be ordered in al things, as her Grace was afore.

The description which is contained in this letter of the manners and disposition of the young princess at so early an age, is assuredly not the least interesting part of it.

God knoweth (says the governess) my Lady hath great pain with her great teeth, and they come very slowly forth: and causeth me to suffer her Grace to have her wil more than I would; I trust to God and her teeth were wel graft, to have her Grace after another fashion than she is yet: so as I trust the King's Grace shal have great comfort in her Grace. For she is as toward a child, and as gentle of conditions as ever I knew one in my leyf. Jesu preserve her Grace. As for a day or two at a hey teym or whan som ever it shul please the King's Grace to have her set abrod, I trost so to indever me, that shee shal so do as shal be to the King's honeur and hers: and then after to take her ease again.

The letter then concludes thus:—

I think master Shelton wil not be content with this. He

* Dr. John Stokesley, who held the see from 1530 to 1540.

† Dr. Thomas Cranmer, who was primate from 1532 till 1553, and in 1556 suffered at the stake under Mary.

may not know it is my desier; but that et es the Kyng's plesure, and yours it should be so, Good my Lord, have my Lady's Grace, and us that be her poor servants, in your remembrance. And your Lordship shal have our harty prayers by the Grace of Jesu: ho ever preserve your Lordship with long life, and as myche honer as your nobel hart can desire. From Hunsdon with the evil hand of har that is your daily bead-woman

MARGET BRYAN.

The superscription is "To the ryght nobel and my syngeler good Lord my Lord Prive Sel, be thys delyverd."

Of the manner in which the Princess Elizabeth was brought up during the remainder of her father's reign, we have scarcely any information. There is extant a record of that period, which furnishes an interesting memorial of her skill and industry at a very early age. It is to be found among the Cottonian Manuscripts, in a list of New Year's Gifts to Prince Edward, in the 30th of Henry VIII. (1539.) The king and his nobles gave principally plate. The Lady Mary's Grace gave a coat of crimson satten, embroidered with gold, with paunses of pearls, and sleeves of tinsel, and four aglets of gold. The LADY ELIZABETH'S GRACE gave "a shyrte of Cam'yke, of HER OWNE WOORKYNGE." She was then only in her sixth year.

Queen Catharine Parr, the last and most fortunate of Henry's queens, is said to have paid considerable attention to the education of both the young princesses Mary and Elizabeth. Their position was greatly bettered by the act which was passed for the settlement of the Crown, soon after her marriage with the king in 1544, and by which they were both declared capable of succeeding to the throne on certain conditions, after the failure of the king's male issue.

Our engraving represents the ancient palace of Placentia at Greenwich, in which Elizabeth was born. Grenewic or Grenevic, as this place was called by the Saxons, is literally the green village, meaning perhaps, as Lysons suggests, the village on the green. We have traces of a royal residence at this place, as early as the year 1300, when Edward I. made an offering of seven shillings at each of the holy crosses in the chapel of the Virgin Mary, and the Prince made an offering of half that sum. Henry IV. dates his will in 1408, from his manor of Greenwich. Henry V. granted this manor for life to Thomas Beaufort, Duke of Exeter, who died at Greenwich in 1426. It was soon afterwards granted by Henry VI. to his uncle Humphrey, Duke of Gloucester, (the youngest son of Henry IV.) who, in 1433, had the royal licence to fortify and embattle his manor-house, and to make a park of two hundred acres. Soon after this, the duke rebuilt the palace, calling it *Placentia*, or the Manor of Pleasaunce; he enclosed the park also, and erected within it a tower on the spot where the Observatory now stands. Upon the Duke of Gloucester's death, which happened in 1447, this manor reverted to the Crown. Edward IV. took great pleasure in finishing and enlarging the palace; and for that purpose, expended a considerable sum. In 1466, he granted the manor with the palace and park, to his queen, Elizabeth, for life. In his reign, the marriage of his youthful son Richard, Duke of York, (afterwards murdered with his brother, Edward V., in the Tower,) with Anne Mowbray, daughter and sole heir of the Duke of Norfolk, was solemnized at Greenwich with great splendour. Henry VII. resided much at this palace; his second son, Prince Henry, (afterwards Henry VIII.,) and his third son, Edmund Tudor, created Duke of Somerset, were born there. Lambarde, the author of the *Perambulation of Kent*, says that this monarch beautified the palace by the addition of a brick front towards the water side; and Stow mentions his repairing the palace in 1501.

Henry the Eighth was born at Greenwich, on the 28th of June, 1491, and was baptized in the parish church by Richard Fox, Bishop of Exeter, Lord Privy Seal; the Earl of Oxford, and Peter Courteney, Bishop of Winchester, being his godfathers. This monarch, from partiality, perhaps, to the place of his birth, neglected Eltham, which had been the favourite residence of his ancestors, and bestowed great cost upon Greenwich, till he made it, as Lambarde says, "a pleasant, perfect, and princely palaice." During his reign it became one of the principal scenes of that festivity for which his court was celebrated. His marriage with his first queen, Catharine of Arragon was solemnized at Greenwich on the 3rd of June, 1509. On May-day, and the following two days, in the year 1511, tournaments were held there; the king himself, Sir Edward Howard, Charles Brandon, and Edward Neville, challenging all comers. In 1512, the king kept his Christmas at Greenwich, "with great and plentiful cheer;" and again in 1513, "with great solemnity, dancing, disguisings, and mummers in a most princely manner," among which was introduced the first masquerade ever seen in England.

On the 13th of May, 1515, the marriage of Mary queen dowager of France, (Henry's sister) with Charles Brandon, Duke of Suffolk, was solemnized publicly at Greenwich. Tournaments were held there in 1517, 1526, and 1536; the king kept his Christmas there in 1521, "with great nobleness and open court," and again in 1525. In 1527 he received the French embassy at this place; and the same year kept his Christmas here "with revels, masks, disguisings, and banquets royal;" as he again did in 1533, in 1537, and in 1543. In the last-mentioned year he entertained twenty-one of the Scottish nobility whom he had taken prisoners at Solway Moss, and gave them their liberty without ransom. Edward the Sixth kept his Christmas at Greenwich, in 1552, George Ferrers, Esq., of Lincoln's Inn, being "Lorde of the merrie disporte." It has been reasonably supposed that the festivities in which he indulged on this occasion, and which were of a character wholly unsuited to his age and constitution, contributed to bring about his death shortly afterwards*; he died at Greenwich Palace on the 6th of July following.

Queen Mary was born at Greenwich, in February, 1516; and baptized there a few days after her birth, Cardinal Wolsey being her godfather, and the Lady Catharine and the Duchess of Norfolk her godmothers. Of Elizabeth's birth at this palace, and of the solemnities which accompanied her christening, we have before spoken. When she ascended the throne, Greenwich became her favourite Summer residence; she also visited it occasionally at other seasons of the year. Of the manner in which she kept her court there, and of other particulars concerning this spot, we shall speak hereafter.

No part of the Palace represented in our engraving in now standing. Charles the Second pulled it all down, it having become much decayed; he intended to raise a nobler structure on the same spot, but succeeded in erecting only one wing, which forms that part of the present Hospital, commonly called King Charles's Building.

* "Their dangerous excitement, their fatiguing joyousness, their late hours and table indulgences, were immediately followed by a consumptive cough, so alarming and exhausting, that the lord of misrule and his merry tumults may be more justly supposed to have produced the fatal change in the king's ever-delicate health, than either grief for his lost uncles, or poison from Northumberland in that 'nosegay of sweet flowers which was presented to him as a great dainty on new year's day.'"—SHARON TURNER

THE LIFE-BOAT,

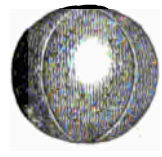
AND THE MEANS OF SAVING THE LIVES OF SHIPWRECKED MARINERS.

THE LIFE-BOAT.

WE may refer with pride, as well as pleasure, to the almost innumerable contrivances and plans, which have from time to time been proposed by ingenious and scientific persons of our own country, for the purpose of preserving life in cases of danger, whether from shipwreck, fire, or other sudden calamity; in the present paper we shall notice a few of the principal means employed to save the lives of shipwrecked mariners. On account of the exhausted state of the poor creatures on board a wreck, it is natural to look for the greatest amount of assistance from persons on shore, and accordingly we find that, although many lives have been saved by the exertions of the crew themselves, much larger numbers owe their preservation to the perilous exertions of adventurous men on the coast.

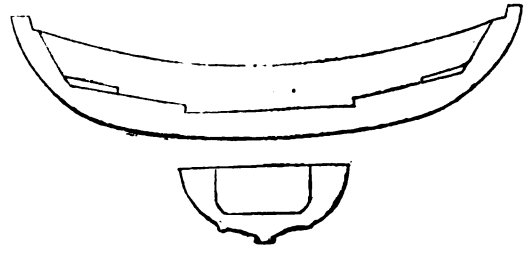
The Life-boat of Mr. Greathead, of South Shields, has been the most successful of these inventions. A model of this boat was sent to the Society of Arts, and in 1802 this Society presented the inventor with their gold medal and fifty guineas. So highly was it appreciated by government, that a reward of 1200*l.* was subsequently voted by Parliament, besides other rewards by the Trinity House and Committee of Lloyd's; this latter institution devoted also 2000*l.* to the purpose of building boats on Mr. Greathead's plan. Since this time most of the dangerous parts of our coasts have been furnished with life-boats on the same construction.

The length of the life-boat is thirty feet, the breadth ten feet, the depth, from the top of the gunwale to the bottom of the keel in midships, three feet three; but from the gunwale to the platform, or boarding within, it is but two feet four inches. The form of this boat is very different to that of those in common use, and from its construction it is impossible it can upset. It is said that its peculiar figure was suggested by the properties possessed by the sections of an oblate spheroid, a globular figure, flattened on two of its opposite sides, a form exactly resembling that of an orange. Indeed the figure and power of this boat may be popularly illustrated by means of a simple operation upon this fruit. Take an orange, and divide the skin by two circular incisions, as in the annexed figure; this will divide the rind into four portions, each a miniature life-boat, when separated carefully from the fruit. If either of these pieces are thrown into a vessel of water, it will be seen that, although by overloading it may be sunk, it never can be overturned by any weight placed within it. Its shape then giving the boat this property, to guard against its sinking, the sides, from the under part of the gunwale along the whole length of the regular shear, extending twenty-one feet six inches, are cased with layers of cork, to the depth of sixteen inches downwards, the thickness of this casing being four inches.



The boat being of the same form at both ends, can be rowed in either direction; the rowing oars are short; but those employed for steering, for there is no rudder, are one-third longer.

The cork weighs nearly seven hundred weight, and from this it may be well understood, what an immense accession of buoyancy is gained; so light is she, and so well formed, that even when full of water she is rowed with ease, and obeys the helm with the greatest quickness.



Second in importance to the Life-boat alone, in the humane cause of saving life from shipwrecks, are the ingenious inventions of the veteran philanthropist, Captain Manby. This worthy gentleman has devoted a considerable portion of his long and active life to devising and perfecting the means of forming a communication between the crew of a vessel in danger and the persons on shore, by conveying a rope from the shore to the ship, or from the ship to the shore. This Captain Manby accomplishes by affixing a shot to a rope, discharging it

from a gun, a mortar, or some other piece of ordnance, so that the rope should become entangled with the rigging of the ship, and thus lay the foundation for a more secure communication. His first object was to coil the rope in such a manner, that, in uncoiling, there shall be no danger of entanglement, as a very slight hitch would alter the direction of the shot, or, perhaps, break the rope.

The following method, fig. 1, is recommended as one of the best, particularly on account of its allowing the eye to run rapidly over the coils, for the purpose of ascertaining whether it has been disturbed by the storm. The rope is arranged in what

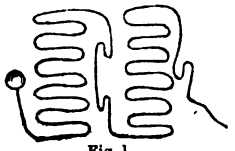


Fig. 1.

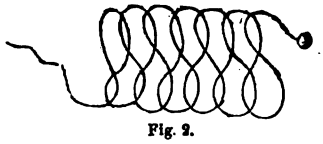
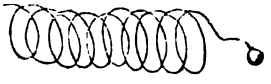


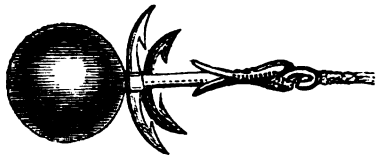
Fig. 2.



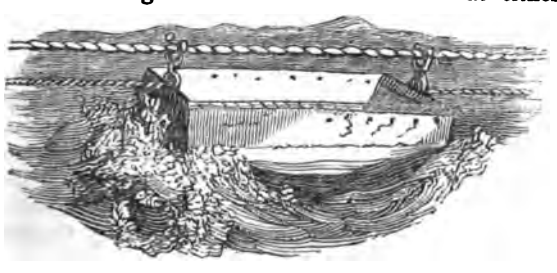
what are called French *fakes*, or tiers. Other methods are also resorted to, as a *whale-laid* coil, or a chain-fake, fig. 2. But as all these methods require time and care, they are likely to fail in the hurry of the moment, and a rope kept ready coiled in a basket, so that it could be carried on the back of a man like a knapsack, is considered the most certain. The difficulty of fixing the shot so that the flame of the gunpowder might not burn its attachment to the rope, was next to be overcome, and it was found that a thong of stout platted hide, woven extremely close, was capable of most resistance, being, at the same time, not easily inflamed and very elastic, for chains of every description were snapped in two by the sudden jerk.

The shot employed was of two sorts, round shot

with a loop, to which to affix the platted hide, and barbed shot; the advantage of this last is, that it



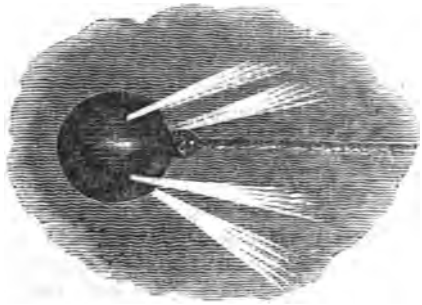
more readily entangles itself with the rigging. If the rope has reached its destination, one much stronger is fixed to it by the people on shore; to this thicker rope a block is fixed, through which a smaller rope is rove, the two ends being left on shore so as to form a running tackle: when all is secure at either



LIFE-PRESERVING COT.

end, a cot, a kind of cradle, which is part of the life-preserving apparatus, is slung upon the thick rope, the two ends of the smaller rope being fastened to each extremity of the cot, so that it may be hauled on board the ship and back again to shore: this cot is intended more particularly for women and children, and is furnished with lashings all round, while the bottom is made of strong netting to allow the water to run out.

In order to render the passage of the shot visible at night, a shell instead of a shot is fixed to the rope; this shell has four holes, in which are fixed



as many fuzes. The shell itself being filled with the most brilliant combustible composition, its effect when passing through the air, is surprisingly bright.

THE ATMOSPHERE.

THE Atmosphere is an element which we cannot see, but which we feel investing us wherever we go; whose density we can measure to a certain height; whose purity is essential to existence; whose elastic pressure on the lungs, and on and around the frame, preserves man in that noble attitude which lifts his head towards the skies, and bids him seek there for an eternal home. The atmosphere is neither an evaporation from earth nor sea, but a separate element bound to the globe, and perpetually accompanying it in its motions round the sun. Can we for an instant imagine that we are indebted for the atmosphere only to some fortuitous accident? If there were no atmosphere, and if we could possibly exist without one, we should be unable to hear the sound of the most powerful artillery, even though it were discharged at the distance of a single pace. We should be deprived of the music of the sea, the minstrelsy of the woods, of all the artificial combinations of sweet sounds, and of the facinating tones of the human voice itself. We might make our wants and our feelings perceptible to each other, by signs and gesticulations, but the tongue would be condemned to irremediable silence. The deliberations of assemblies of men, from which laws and the order of society, have emanated, could never have taken place. The tribes of mankind would wander over the earth in savage groups, incapable of civilization, and the only arts which they could ever know, would be those alone that might enable them to destroy each other.——*Quarterly Review.*

THERE are habits, not only of drinking, swearing, and lying, and of some other things, which are commonly acknowledged to be habits, and called so, but of every modification of action, speech, and thought; man is a bundle of habits. There are habits of industry, attention, vigilance, advertency; of a prompt obedience to the judgement occurring, or of yielding to the first impulse of passion; of extending our views to the future, or of resting upon the present; of apprehending, methodizing, reasoning; of indolence, dilatoriness, of vanity, self-conceit, melancholy, partiality; of fretfulness, suspicion, captiousness, censoriousness; of pride, ambition, covetousness; of overreaching, intriguing, projecting; in a word, there is not a quality of function, either of body or mind, which does not feel the influence of this great law of animated nature.——PALEY.

EASY LESSONS ON CHRISTIAN EVIDENCES.

No. XIII.

MODERN JEWS.

ONE of the difficulties with which the minds of some Christians are perplexed, is, that Jesus Christ should have been rejected by the greater part of his countrymen, the Jews; and that they who had been, according to our Scriptures, for so many ages, God's favoured and peculiar People, should be now, and for above seventeen centuries, without a country, and scattered as outcast strangers through the world.

Their present condition and past history are indeed something very extraordinary, and quite unlike what has befallen any other nation. But though we may not be able to explain all the circumstances relative to this wonderful people, it will be found on reflection that they furnish one of the strongest evidences for the truth of the very religion which they reject.

You know that when the Jews received the law through Moses, they were promised success and prosperity as long as they should obey the Lord; and that heavy judgments were denounced against them in case of disobedience. It was foretold that they should be defeated by their enemies, driven from their country, scattered abroad, and continually harassed and oppressed. These threats are set forth in various parts of the books of Moses, and most particularly in the twenty-eighth chapter of Deuteronomy. "Thou shalt become an astonishment, a proverb, and a by-word among all the nations whither the Lord shall lead thee. The Lord will make thy plagues wonderful, and the plagues of thy seed, even great plagues of long continuance. And the Lord shall scatter thee among all people, from the one end of the earth even unto the other."—v. 37, 59, 64.

And the same is to be found in various parts of the writings of several of the prophets, who lived some ages after. In particular, there is one in Ezekiel, which agrees most remarkably in one very curious particular, with the state of the Jews at this day; namely, where he declares that they should, in the midst of their sufferings, remain a distinct people, unmixed with, and unlike other nations; although it appears that in his time, they were very much disposed to unite themselves with the rest of mankind, so as to become one of the Gentile nations, and to lay aside all the distinctions of their own race. "That which cometh into your mind shall not be at all, that ye say, We will be as the heathen, as the families of the countries, to serve wood and stone." (Ezekiel xx. 32.)

Now we find in the Old Testament, that, in several instances, these judgments did fall on the Jews; and especially when they were carried away captive to Babylon. And some persons may suppose that these instances were all that Moses and the prophets had in view. But whatever any one's *opinion* may be, it is a *fact*, of which there can be no doubt, that the Jewish nation are actually suffering, at this day, such things as Moses and the prophets predicted. Whether Moses and Ezekiel had in view what is now taking place, or not, may be a matter of opinion; but it is a matter of fact, that what is now taking place, does agree with their predictions. Jerusalem and its Temple were taken and burnt by the Romans, about forty years after the crucifixion of Jesus Christ. The Jews were driven from their country, and never allowed to settle in it again. Hundreds of thousands were sold as slaves; and the whole people were cast forth as wanderers among the Gentiles; and they have ever since remained a nation of exiles, unsettled, harassed and oppressed in many instances most cruelly, not only by Pagans and Mohammedans, but also (to our shame be it spoken,) by Christian nations; and still remaining a distinct people, though without a home.

One of the most remarkable points relative to these predictions respecting the Jews, and their present condition, is this; that the judgments spoken of by Moses, were threatened in case of their departing from the law which he delivered, and especially, in case of their worshipping false gods; and yet, though in former times they were so apt to fall into idolatry, they have always, since the destruction of Jerusalem, steadily kept clear of that sin; and have professed to be most scrupulous observers of the law of Moses. And what is more, all the indignities and persecutions that any of them are exposed to, appear to be the *consequence* of their keeping to their religion, and not of their forsaking it. For a Jew has only to give up his religion, and conform to that of the country he lives in, whether Christian, Mohammedan, or Pagan, and lay aside the observances of the law of Moses, and he immediately ceases to be reproached as a Jew, and an alien, and is mingled with the people around him. So that the Jews of the present day seem to be suffering for their observance of the law, just the penalties threatened for their departure from it.

At first sight this seems very hard to explain; but, on reflection, you will find the difficulty cleared up, in such a way as to afford a strong confirmation of your faith. First, you should observe, that the Jews themselves admit that a Christ or Messiah was promised them; and that to reject Him on his coming would be an act of rebellion against the Lord their God. Moses foretold that the Lord should raise up from among them a Prophet like Moses himself; and "whosoever should not hear that Prophet," God "would require it of him;" and "that he should be destroyed from among the people."—(Deut. xviii. 15—19; Acts iii. 22, 23.) This is generally understood (as it is applied in the Acts,) to relate to the Messiah, or Christ; whom the other prophetical writers of the Old Testament (as both Jews and Christians are agreed,) more particularly foretold and described. Now *we* hold that the Jews have been guilty of this very act of disobedience, in rejecting the Christ. And though they, of course, do not confess themselves thus guilty, because they deny that Jesus of Nazareth was the true Christ, yet they so far agree with us as to acknowledge that the rejecting of the true Christ on his coming would be such a sin as would expose them to the judgments which Moses threatened.

To us, therefore, who do believe in Jesus, this affords an explanation of their suffering these judgments.

But, secondly, besides this, you will perceive on looking more closely, that the Jews of these days do *not* really observe the law of Moses, though they profess and intend to do so. They have, indeed, kept to the *faith* of their forefathers; but not to their religious *observances*. For, the chief part of the Jewish worship consisted in offering sacrifices distinctly appointed by the Lord Himself, in the law delivered by Moses. There was a sacrifice appointed to be offered up every day, and two on the Sabbath; besides several other sacrifices on particular occasions. Now, the modern Jews, though they abstain from certain meats forbidden in their law, and observe strictly the Sabbath and several other ordinances, yet do not offer any sacrifices at all; though sacrifices were appointed as the chief part of their worship.

The reason of this is, that they were strictly forbidden to offer sacrifices except in the *one place* which should be appointed by the Lord for that pur-

pose. And the place last fixed on for these offerings having been the Temple at Jerusalem, which was destroyed about seventeen hundred years ago, and has never been restored, the Jews are now left without any place in which they can lawfully offer the sacrifices which their law enjoins.

The Jews, accordingly, of the present day, plead that it is not from wilful disobedience that they neglect these ordinances, but because they cannot help it. But to say that it is not their own fault that they do *not* observe the ordinances of their religion, is quite a different thing from saying that they do observe them. They may explain *why* they cannot keep the law of Moses; but they cannot say that they do keep it.

Now Christians hold that the ceremonies of that law were not originally designed to be observed by all nations, and for ever; that "the law had only a shadow of good things to come," (Heb. x. 1,) that is, of the Gospel; and that it was designed that the sacrificing of lambs and bullocks should cease at the coming of the Christ. A Jew, on the contrary, will not allow that these were designed ever to cease: but he cannot deny that they *have* ceased, and that, for above seventeen centuries. Let a Jew explain if he can, how it is, that, for so long a time, Providence has put it out of the power of the Jews to observe the principal part of their religion which they maintain was intended to be observed for ever.

And this is also very remarkable; that the religion of the Jews is almost the only one that *could* have been abolished *against the will* of the people themselves, and while they resolve firmly to maintain it; *their* religion, and theirs only, could be, and has been, thus abolished in spite of their firm attachment to it, on account of its being dependent on a particular place,—the Temple at Jerusalem. The Christian religion, or again, any of the Pagan religions, could not be abolished by any force of enemies, if the persons professing the religion were sincere and resolute in keeping to it. To destroy a Christian place of worship, or to turn it into a Mohammedan mosque, (as was done in many instances by the Turks,) would not prevent the exercise of the Christian religion. And even if Christianity were forbidden by law, and Christians persecuted, (as has in times past been actually done,) still if they were sincere and resolute, they might assemble secretly in woods or caves; or they might fly to foreign countries to worship God according to their own faith; and Christianity, though it might be driven out of one country, would still exist in others.

And the same may be said of the Pagan religions. If it happened that any temple of Jupiter, or Diana, or Woden, were destroyed, this would not hinder the worshippers of those gods from continuing to worship them as before, and from offering sacrifices to them elsewhere.

But it was not so with the Jews. Their religion was so framed as to make the observance of its ordinances impossible, when their Temple was finally destroyed. It seems to have been designed and contrived by Divine Providence, that as their *law* was to be brought to an end by the Gospel, (for which it was a preparation,) so, all men were to *perceive* that it did come to an end, notwithstanding the obstinate rejection of the Gospel by the greater part of the Jews. It was not left to be a question and a matter of *opinion*, whether the sacrifices instituted by Moses were to be continued or not; but things were so ordered, as to put it out of Man's power to continue them.

THE EEL.

ALTHOUGH the Eel is a fish with which we are so familiar, and one which comes so frequently under the notice of most people, until of late years very little was known of its habits and general economy. Mr. Yarrell has thrown much additional light on the history of the Eel tribe; and in the following account we have borrowed largely from his splendid work on *British Fishes*. According to this naturalist, there are three well-ascertained species of fresh-water Eels, to which he has given the following names,—the Sharp-nosed Eel, (*Anguilla acutirostris*); the Broad-nosed Eel, (*Anguilla latirostris*); and the Snig, (*Anguilla medirostris*); the Grig is also considered a separate species by Baron Cuvier. In addition to this there is the Conger Eel, which inhabits the coasts of the sea.

The form of the Eel, resembling that of the serpent, has long excited a prejudice against it, which exists in some countries even to the present time; and its similarity to snakes has even been repeated by those, who, from the advantages of education, and their acquirements in natural history, might have been supposed capable of drawing more accurate conclusions. There is but little similarity in the snake and the Eel, except in the external form of the body; the important internal organs of the two animals, and the character of the skeleton, are most decidedly different.

Eels are, in reality, a valuable description of fish; their flesh is excellent as food; they are very numerous, very prolific, and are found in almost every part of the world. The various species are hardy, tenacious of life, and very easily preserved. In this country they inhabit almost all our rivers, lakes, and ponds; they are in great esteem for the table, and the consumption in our large cities is very considerable. The London market is principally supplied from Holland, by Dutch fishermen. There are two companies in Holland, having five vessels each; their vessels are built with a capacious well, in which large quantities of Eels are preserved alive till wanted. One or more of these vessels may be constantly seen lying off Billingsgate; the others go to Holland for fresh supplies, each bringing a cargo of 15,000 to 20,000 pounds' weight of live Eels, for which the Dutch merchant pays a duty of £13 a cargo for his permission to sell. Eels and salmon are the only fish sold by the pound weight in the London market.

Eels are not only numerous, but in great request in many other countries. Ellis, in his *Polynesian Researches*, says,—

In Otaheite, Eels are great favourites, and are tamed and fed until they attain an enormous size. The pets are kept in large holes two or three feet deep, partially filled with water. On the sides of these pits they generally remained, excepting when called by the person who fed them. I have been several times with the young chief, when he has sat down by the side of the hole, and, by giving a shrill sort of whistle, has brought out an enormous Eel, which has moved about the surface of the water, and eaten with confidence out of his master's hand.

The habits of Eels induce them to make two migrations in the course of the year, one in Autumn, to the sea, and the other in Spring, or the beginning of Summer, from the sea. The Autumn migration is performed by the adult Eels, and is supposed to be for the purpose of depositing their spawn; and it is said that these fish never return up the river: the Spring migration is supposed to consist entirely of young Eels. Mr. Yarrell is inclined to think there is an error in the belief that the old Eels do not return.

The passage of countless hundreds of young Eels has been seen and described as occurring in the Thames, the Severn, the Parrett, the Dee, and the Ban. I am, however, of opinion, that the passage of adult Eels to the sea, or rather to the brackish water of the estuary, is an exercise of choice, and not a matter of necessity; and that the parent Eels return up the river with the young fry.

All authors agree that Eels are extremely averse to cold. There are no Eels in the Arctic Regions, none in the rivers of Siberia, the Wolga, the Danube, or any of its tributary

streams. There is no doubt that fishes in general, and Eels in particular, are able to appreciate even minute alterations in the temperature of the water they inhabit. The mixed water they seek to remain in during the colder months of the year, is of a higher temperature than the pure fresh-water of the river, or that of the sea. It is a well known law in chemistry, that when two fluids of different densities come in contact, the temperature of the mixture is elevated for a time in proportion to the difference in the density of the two fluids. Such a mixture is constantly taking place at the mouths of rivers that run into the sea, and the mixed waters maintain a temperature two degrees warmer than that of the river or the sea. This elevation in the temperature of the water of estuaries and the mouths of rivers, is, I have no doubt, one reason why they in general abound with young fish.

During the Winter, the Eels remain imbedded in the mud twelve or sixteen inches deep, by the side of the channel of the stream they frequent.

Great doubt has existed as to whether the Eel produces its young alive, or deposits its spawn in the same manner as other fishes; but the observations of Mr. Yarrell and others, have gone far to prove that Nature does not step out of her regular course in the case of the Eel; that is, that the Eel produces its young in the same way as the rest of the class of fishes. Singular notions were entertained on this subject by the ancients and by some of the moderns. Aristotle believed they sprung from the mud; Pliny, from fragments which were separated from their bodies by rubbing against the rocks. Helmont believed they came from May-dew, and might be obtained by the following process.

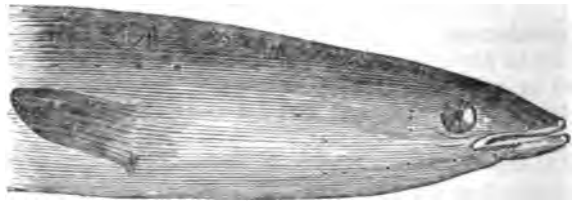
Cut up two turfs covered with May-dew, and lay one upon the other, the grassy sides inwards, and thus expose them to the heat of the sun; in a few hours there will spring from them an infinite quantity of Eels.

The reason why Eels have been considered *viviparous*, has arisen probably, from their being infested with numerous intestinal worms, which have been mistaken for young Eels. The sudden appearance of Eels in places where they were known not to have existed previously, has added a little to the mystery of their mode of production. But there are many well-authenticated accounts of the manner in which this is most likely effected. The Eel in warm and moist nights, has been known to quit the water and travel a considerable distance through the wet grass. One instance of this occurs in Dr. HASTING'S *Natural History of Worcestershire.*

I will here mention a curious confirmation of the opinion in favour of the overland migration of Eels. A relative of the late Mr. Perrot was out in his park with his keeper, near a large piece of water, on a very beautiful evening, when the keeper drew his attention to a fine Eel quietly ascending the bank of the pool, and with an undulating motion making its way through the long grass; on further observation, he perceived a considerable number of Eels quietly proceeding to a range of stews, nearly at the distance of a quarter of a mile from the large piece of water from whence they started. The stews were supplied by a rapid brook, and in all probability, the instinct of the fish led them in that direction, as a means of finding their way to some large river from whence their ultimate destination, the sea, might be obtained.

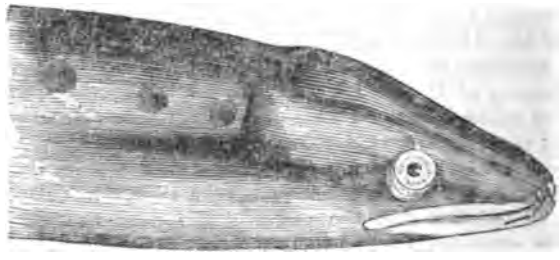
There is no doubt, however, that Eels will breed in fresh-water ponds which have no communication with the sea or river.

The Sharp-nosed Eel is that most commonly met with in the markets; as its name implies, the snout is much more pointed than that of the other species; the head is flattened on the sides, and the eye is placed immediately over the angle of the mouth. In streams of pure water the belly of this Eel is clear and bright; it is then called a Silver Eel. This Eel is found of a larger size than either of the other species; at Cambridge, the skins of two are preserved which weighed together fifty pounds; the heaviest weighing twenty-seven pounds, the second twenty-three pounds.



THE SHARP-NOSED EEL.

The Broad-nosed Eel is distinguished from the last by its broad head, flattened on the summit; the eye is placed rather in advance of the angle of the mouth.



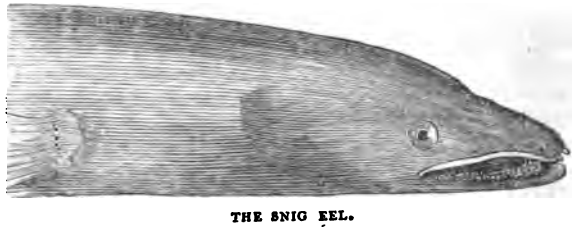
THE BROAD-NOSED EEL.

This is the Grig, or Glut, Eel, of Pennant, who says "they have a larger head, blunter nose, and thicker skin than the common sort." The term grig is applied near London to the small-sized Eel, whose

THE GRIG EEL.

head is shown in the engraving; but the fishermen in the London river, call all small Eels which do not exceed eight or nine inches in length, Grigs.

The fourth species of Eel frequenting fresh water, is the Snig. This seems to be very rare, Mr. Yarrell



THE SNIG EEL.

having only seen two specimens, both of which were taken from the Avon, in Hampshire, where it is considered distinct from the common and well-known Eels.

IRRESOLUTION.—In matters of great concern, and which must be done, there is no surer argument of a weak mind than irresolution; to be undetermined where the case is so plain, and the necessity so urgent. To be always intending to live a new life, but never to find time to set about it; this is as if a man should put off eating, and drinking, and sleeping, from one day and night to another, till he is starved and destroyed.—TILLOTSON.

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THE

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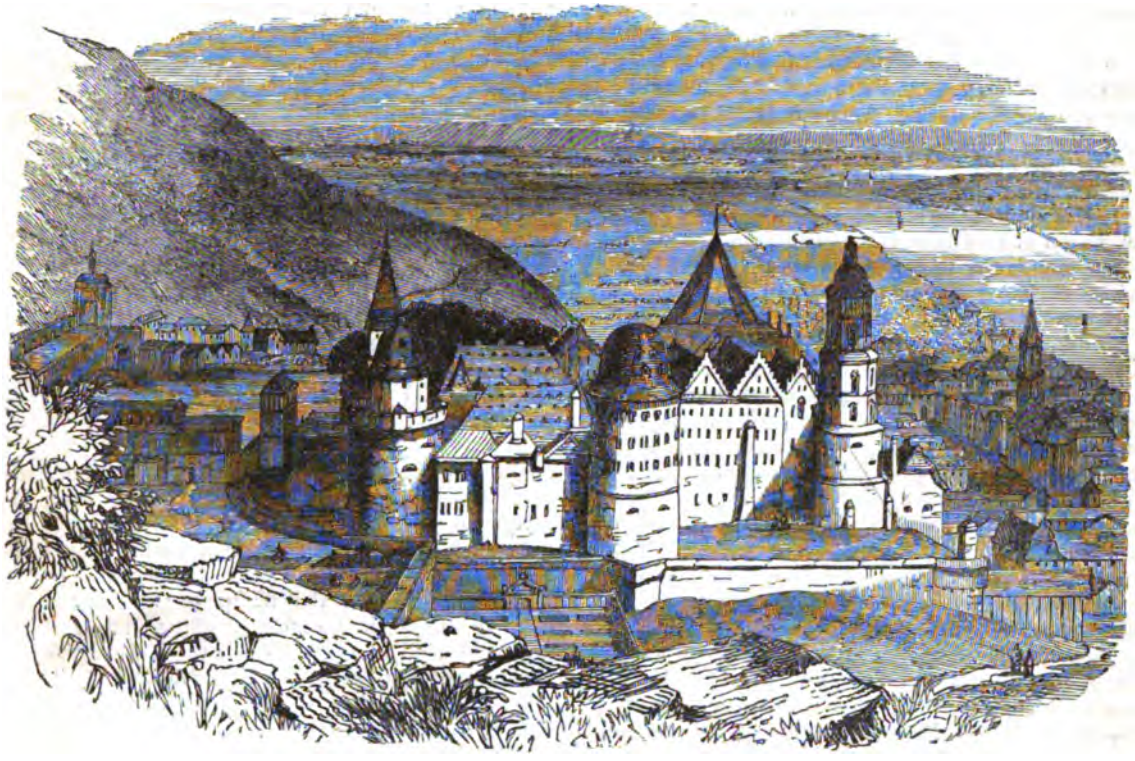
THE CASTLE OF HEIDELBERG. No. II.



EAST VIEW OF HEIDELBERG CASTLE, FROM A DRAWING MADE IN 1619.

THE Regent dying in 1572, was succeeded by his nephew Frederic the Fourth, who added much to his residence, and one of the finest and most perfect portions, built in a style of florid architecture, corresponding with the erections of Otho Henry, and embellished with the most gorgeous statues of the electors, remains a monument of his taste. This structure, which forms the south side of the great Tournament Court, was devoted to the purpose of a chapel, with a fine ball-room above, and still bears the name of *Friederich's Bau*, or Frederic's Building. The magnificent stone balcony overlooking the town was also the work of this period: here all travellers are taken to see an indentation somewhat resembling the impress of a human foot, in one of the flagstones; concerning which, the legend goes, that a young princess who, in her ardour to join her lover, leaped from a three-story-high window above, and being, we conclude, more nimble than the gentleman was dexterous, descended with such violence, as to imprint the shape of her foot in the solid pavement. The thousands of curious feet, great and small, which have since measured their length in this place, have maintained its shape, and swelled it to colossal dimensions. Whether the lady gave rise to the story of the stone, or *vice versâ*, we leave our readers to decide; we tell the tale as it was told to us.

But to return to Frederic the Fourth. In the University library, part of a journal kept by this Pfalzgraf between the years 1596 and 1599, is still preserved. As far as regards the eating, drinking, and hunting routine of the day, it doubtless is a faithful, and, therefore, interesting picture; but we obtain from it no information, either local or historical, concerning the Castle. Dying in 1610, he was succeeded by his son Frederic the Fifth, subsequently king of Bohemia, who, from his alliance with Elizabeth, daughter of James the First of England, from his prominent position at the commencement of the thirty years' war, of which his cruel fortunes first fired the fatal spark, and from the train of afflictions, public and domestic, which hunted him to an early grave, has obtained a mournful celebrity in the annals of the Palatinate. With regard to the improvement of the Castle, also, his name and that of his high-minded consort stand equally forward, and though its strength and importance declined with his fortunes, and never entirely rallied again, yet we must not forget that he it was who raised it to that splendour which still lingers over its ruined halls. Animated alike by a natural taste for magnificence, by a highly cultivated mind, and, above all, by the most ardent passion for his English bride, he spared no pains in rendering his Castle worthy her abode. In honour of her, a palace in the Elizabethan style of architecture, and furnished on the model of English comfort, quickly arose, and by the simplicity and lightness of its proportions, remains strikingly distinct from the massive gorgeousness of the surrounding walls. Nothing could surpass the varied attractions of

the gardens, of which an elegant archway, still called Elizabeth's gate, formed, and yet forms, a conspicuous ornament; while De Caux, architect to the king of France, employed in these additions, taxed his invention in the erection of grottoes, obelisks, fountains, &c. Our print of the Castle, is copied from a drawing taken in 1619.

Scarcely were these improvements completed, and the first years of happy royal wedlock flown over, when the election of Frederic to the crown of Bohemia called this interesting couple from their beloved Heidelberg; and, as it subsequently proved, from all permanent happiness and distinction. The dignity of a crown was but short-lived; a few years saw them fugitives and pensioners in a foreign land, while their proud patrimonial castle and lands suffered all the horrors of siege, famine, and spoliage, under the devastating influence of the thirty years' war. Our present royal family of England derives its descent from this same Elizabeth Stuart, Countess Palatine, and queen of Bohemia, through Sophia, the youngest of her numerous and ill-fated family, who became wife to the Elector of Hanover, and mother of George the First.

Frederic the Fifth died in obscurity at Mayence, in 1632, and on the 7th of October, 1649, after a period of unexampled horror and public calamity, Charles Louis, his eldest son, was reinstated in the ruined halls of his fathers. His first acts were to repair the breaches of war and plunder, and although his lands still groaned beneath their effects, he contrived to carry on his plans with solidity and expedition, and, at the same time, to recruit the broken fortunes of the Palatinate. His only daughter, Elizabeth Charlotte, he bestowed in marriage on the Duke of Orleans, and thereby unconsciously laid the foundation of that fearful struggle which once more laid his towns and villages in ashes, and gave the finishing blow to the downfall of Heidelberg Castle. His only son, by his royal consort, Charles Louis, studied, and received a doctor's degree, at the University of Oxford, a ceremony which was followed by the presentation of the order of the Garter from his cousin Charles the Second. Receiving during his sojourn in England, in 1680, tidings of his father's demise, he hastened home and assumed the sovereignty. This prince also busied himself in the work of reparation.

The favourite amusements of this Elector consisted in theatrical and military spectacles, and a curious work still exists of the pageants and ballets performed at the castle. Having over-exerted himself, however, at a mock siege, a tedious illness was induced, which terminated his life. Here the Palatinate line expires, Charles Louis leaving no issue, and henceforward the history of the castle presents only a successive picture of treachery, violence, and final desolation.

Philip William, of the house of Neuburg, was the first to claim and assume the seat of authority at Heidelberg. Two antagonists, however, soon appeared in the lists against him, in the persons of Leopold, Count of Veldenz, and Louis the Fourteenth of France, the alliance of whose brother, the Duke of Orleans, with the late Elector's sister, we have already noticed. The pretensions of Veldenz were quickly satisfied, or compromised; France proved a weightier foe, and not finding the channel of political menace and negotiation successful, deluged the devoted land with a hostile force, and military resistance proving useless, the castle and town capitulated on the 25th of October, 1688, but upon honourable conditions. No sooner, however, were the French in possession, than they began to abuse all authority, and to violate every treaty. The town's-people were maltreated, exorbitant levies exacted, the state-papers purloined, &c. These acts, however, were only introductory to the succeeding ravages, which commenced by the arrival of a company of French miners, who pounced with the weapons of destruction upon the proudest portions of the castle. At the same time, the surrounding suburbs and villages were fired, and, as if they had only waited for this beacon to let loose the demons of carnage and plunder, Heidelberg now became the scene of all the horrors attending a town taken by storm. The approach of a body of German troops seemed only to sharpen every diabolical purpose, the Town-house, the Marstall, and every building of importance, was reduced to ashes—the windows at the Castle were smashed, the ornamental stuccoes knocked to pieces—all the wine that was not poured out in licentious excess carried off to Manheim, and finally, before their evacuation, as if to complete the sum of wanton destruction, the Exchequer-house, the Neckar-bridge, and the so-called splendid Thick-tower were remorselessly blown into fragments. At length, on the 2nd of March, 1689, the invaders left the regions they had converted into a desert, taking with them, however, several persons of distinction as hostages. The castle was then occupied by an imperial and allied garrison, under the command of General Heydersdorf, and some show of reparation commenced. In the mean time, Philip William had retired to Vienna, where he died of apoplexy, in 1690, and was succeeded, or, at least, nominally so, by his son John William. Heidelberg was now little more than a heap of stones; the new Elector, therefore, took up his residence at Düsseldorf, and merely visited the scene of the late struggle to receive the fealty of the surrounding country. But the measure of affliction was not yet full—the vials of destruction not yet emptied over the devoted castle and town. Although stationed in quality of protector to the town's-people, General Heydersdorf scrupled not to extort money, and other supplies from them, and finding his protection but another name for plunder, many families emigrated from the homes which no longer ensured their safety. Happy were they in comparison with those who still clung to the place of their birth!

On the 17th of May, 1692, a body of thirty thousand French troops, with General Melac at their head, marched direct upon Heidelberg, and summoned the town to surrender. On the 20th, fresh forces arriving, General Melac mounted the hills above the castle, took possession of the old ruined fortress, and dispersed his men on the adjacent mountains. Other divisions gathered round the town, cutting fosses and throwing up embankments, to the no small embarrassment of the German commander. Unappalled by these preparations and the strength of their foes, the garrison, composed of a motley group of citizens and soldiers, determined to defend the walls to the last; but, whether paralyzed by fear, or disarmed by a foreign bribe, General Heydersdorf gave such contradictory orders, spiking, for instance, twenty-three of his own cannon, and withdrawing his troops from the most important posts, that it soon became manifest what his intentions were. Indignant at his treachery, the officers under him used every exertion in counteracting his influence, and animating the soldiery; but their enemies had gained too much ground—the suburb was taken, and the occupation of the town soon followed. This time not even the semblance of humanity was shown; and the pillage of the town was granted to five regiments, who too well availed themselves of the barbarous licence. Mingled with grosser acts, every

refinement of cruelty was practised. A crowd of wretched fugitives were forced into the church of the Holy Ghost, and there detained, whilst their persecutors set fire to the roof above them, and taking a demoniacal pleasure in their distress, released them only for fresh torments when the danger threatened to become positive destruction. At length, when scarcely an article was left to plunder, nor a human being to destroy, the whole town was given over to the flames. All that now remained was the castle, which, surrendering in a few days, fared no better than its unfortunate neighbour. The valuable furniture was stolen or destroyed, the graves of the electors broken open, and their bones scattered; at the same time, the chief towers and fortifications, surviving the previous struggle, were undermined and blown up, the Otho Henry's building burnt to the shell it now presents, and in short, every species of destruction adopted which tyranny and brutality could suggest. On the news of the destruction of Heidelberg, and the devastation of the Palatinate, reaching the French capital, Louis the Fourteenth, the pride of modern chivalry, and model of every gallant, ordered a public *Te Deum* in the principal churches, and caused a medal to be struck with the ruins of Heidelberg, with the inscription, *Rex dixit, et factum est.*—(The king said it, and it was done.)—General Heydersdorf, whose cowardice or treachery had involved such sad consequences, was summoned by his countrymen before a council of war, and condemned to death. The Emperor, however, granted him his life, but banished him from the Austrian and Suabian circle, beyond the barriers of which he was transported in a butcher's cart, with every mark of ignominy. In 1697, peace was signed at Ryswick, and the Palatinate again began to raise her fallen head; the town emerged from its ashes, the various public buildings commenced erecting, and the University, which had existed but as an empty name around the ruins of its schools, at the beginning of 1700, once more became the resort of the youth of Germany

John William was succeeded, 1716, by his brother Charles Philip, who took up his residence at Heidelberg, and directed his attention to the restoration of the castle; and financial records which still exist, show that much was laid out in repairing the damages of this ancient palace. Not satisfied with these necessary preliminaries, this elector entertained magnificent plans for its further embellishment and increase, which, had they been prosecuted, would have doubtless preserved it to this day, as the proudest of royal residences. But a fatality seemed to attend all efforts for its re-instatement, and those naturally most interested in its preservation, proved its greatest enemies. Among the improvements projected for the town, it was proposed to fit up the church of the Holy Ghost, (which then, and to this day, by means of a trumpery partition-wall, serves for both Catholic and Protestant services,) entirely for the former worship; the Elector promising to erect in its stead a new church for the Reformed portion of the community. This, however, necessitating a trifling alteration in the Heidelberg catechism, and interfering with some old German dogmas, the Burghers made every opposition, and Charles Philip, in a fit of disgust, removed his residence to Manheim, and employed the enormous sums appointed for Heidelberg, in the erection of a palace, and in making extensive additions to that city. Too late did the citizens repent their shortsighted obstinacy; the workmen were withdrawn from the castle, and much traffic from their town; and the solitude of the ruined walls was alone interrupted by the water-cart, which daily fetched its load from the royal fountains for the court at Manheim.

Charles Philip, dying the 31st of December, 1742, Charles Theodore, of the house of Sulzbach, undertook the government, the 1st of January, 1743. Twenty years elapsed before this Elector visited the crumbling halls of his predecessors, when, charmed with its regal grandeur and romantic beauty, he determined to repair a portion for a temporal residence. Again, though from a different quarter, were the plans of restoration frustrated; that very night a thunder storm broke over the ruins, and a flash of lightning taking effect, reduced the castle to the state wherein we now see it.

On Charles Theodore's death, Maximilian of Bavaria assumed the Palatinate; but under the division of Europe by that arch king-maker and deposer, Napoleon, it was allotted to Charles Frederic, Grand Duke of Baden, then a man of seventy-two, who directed that every care should be bestowed in preserving the beautiful ruins, and appointed the laying out of the gardens in the style they now present. In 1811, he was succeeded by his grandson Charles, who dying in 1832, his eldest son, Leopold, a prince of the highest worth, was unanimously declared successor. The charge of preserving the castle is vested in the hands of the Heidelberg corporation, who, although doubtless worthy citizens and excellent members of society, were the last men fitted for such a trust. Big with self-importance, and guided neither by love of antiquity, or feeling for the picturesque, they have continued year by year officiously picking at the castle, endeavouring to make old new, and crooked straight, till much that had survived the violence of its foes, has fallen before the scarcely less destructive civilities of its friends. Such was the extent of the subterranean cellars, groined passages, chambers and dungeons, that it were hard to say whether the castle occupied most space above or below ground. The writer had personally explored this portion, and regretted the destruction of some of its most interesting compartments;—now, by a late corporation edict, all the entrances to this lower world have been beaten down or filled up, and thus it will probably remain, till the plough of some future generation again lay it open to the light of day. Further, the gorgeous pillars, and architectural ornaments interspersed in the building, and especially in the suite of apartments called the Knights' Hall, have been sawn in pieces, and used for different purposes, and many a wooden bench in the surrounding gardens, is supported upon a capital, whose exquisite elegance reminds us, that its form was dictated by the taste of a Raphael.

Nevertheless, Heidelberg Castle still offers, and must for centuries offer, a powerful attraction to all true lovers of antiquity and beauty, and among the thousands who yearly throng through its empty portals, not a few imbibe an impression of symmetry, strength, gorgeousness, and grandeur, which can never be effaced.

He that does not know those things which are of use and necessity for him to know, is but an ignorant man, what ever he may know besides.—Tillotson.

Excellence is never granted to man, but as the reward of labour. It argues, indeed, no small strength of mind to persevere in the habits of industry, without the pleasure of perceiving those advantages which, like the hands of a clock, whilst they make hourly approaches to their point, yet proceed so slowly as to escape observation.—Sir Joshua Reynolds.

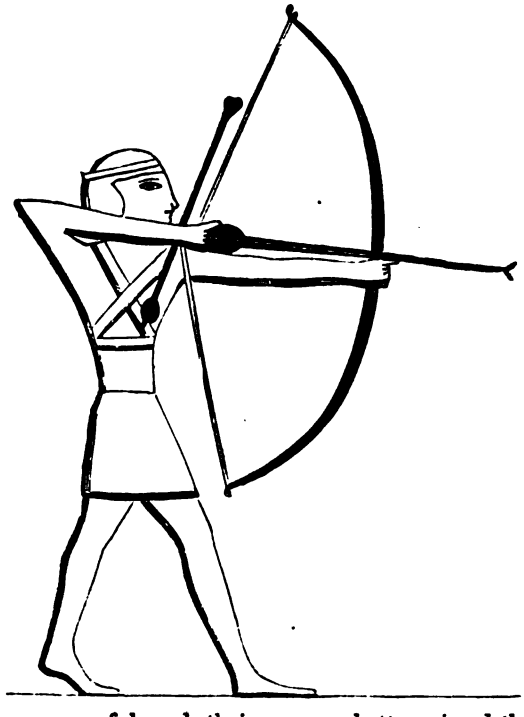
ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY. No. VII

THE BONDAGE OF THE ISRAELITES IN EGYPT.

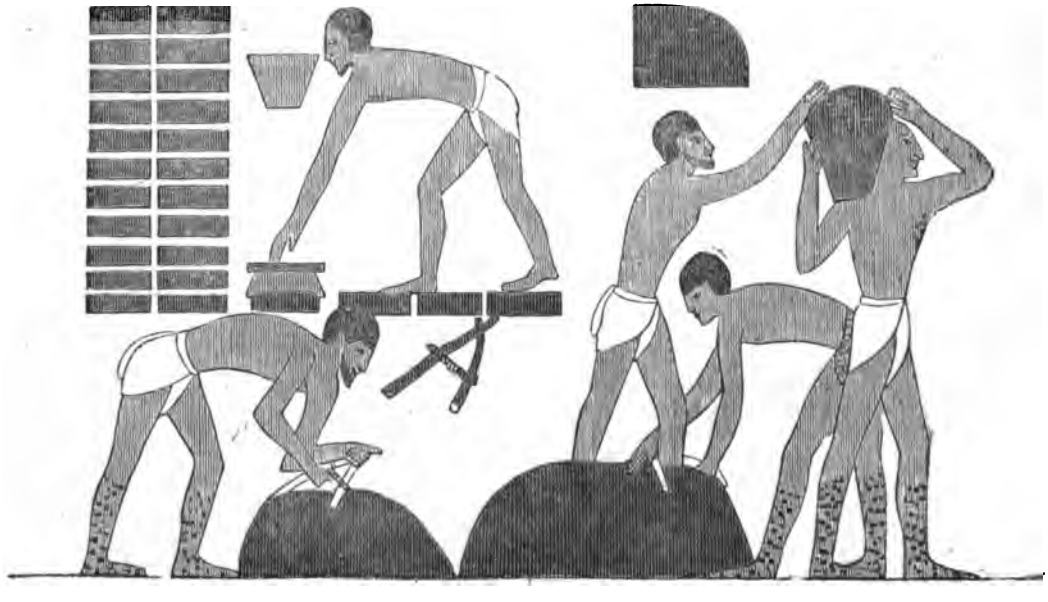
THE interval between the death of Joseph and the birth of Moses, was marked by an important change in the constitution of the Egyptian government, concerning which our authentic information is remarkably indirect and scanty. Several very able writers have laboured with more or less success to elucidate this very obscure period, and the following summary will be found consistent with the Scripture narrative, the Egyptian monuments, and the fragments of Manetho preserved by Josephus.

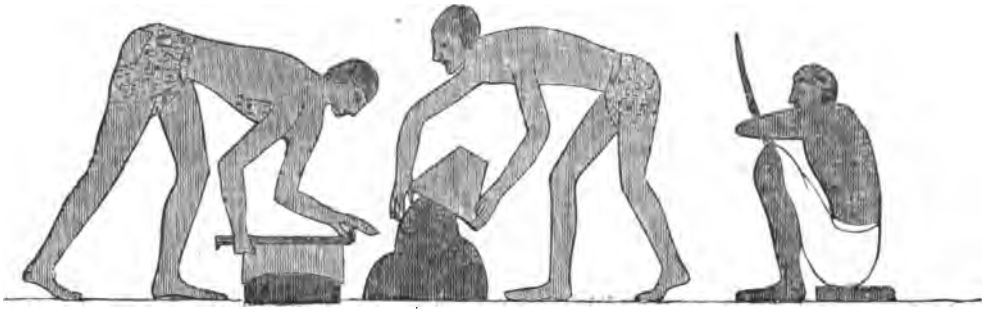
After the Israelites had settled in Goshen, they were engaged in active hostilities with the nomade tribes of Syria and Palestine. A singular record of these wars is preserved in the book of Chronicles, where we find enumerated among the sons of Ephraim, "Zabad his son, and Shuthelah his son, and Ezer and Elead, whom the men of Gath that were born in that land slew, because they came down to take away their cattle." (1 Chron. vii. 21.) From this interesting passage we obtain information respecting the condition of the Hebrews in Goshen, previous to their being reduced into slavery, which we find nowhere else recorded. We find that they loyally fulfilled the conditions of the tenure by which they held the land of Goshen, namely, checking the incursions of the eastern nomades; they not only did so, but carried the war into the enemies' country, and swept the plains of Palestine even to the distant city of Gath.

The bow was the favourite weapon of the Egyptians, and is so represented on the monuments. It deserves also to be remarked, that the Egyptians drew the bow to the ear, not to the breast as was usual with the Greeks and Romans; consequently, their bows were



more powerful, and their arrows better aimed than those of other nations. It may be added that the





Israelites, after their settlement in Canaan, appear to have neglected archery, for we read that, immediately after his accession, David "bade them teach the children of Israel the use of the bow." (2 Samuel i. 17.)

From the brief narrative in the book of Chronicles, it seems that the Hebrews in Goshen enjoyed a qualified independence; they made wars upon their own account, and retained all their pastoral usages. In some of their expeditions they were unsuccessful, and perhaps subjected to very severe reprisals.

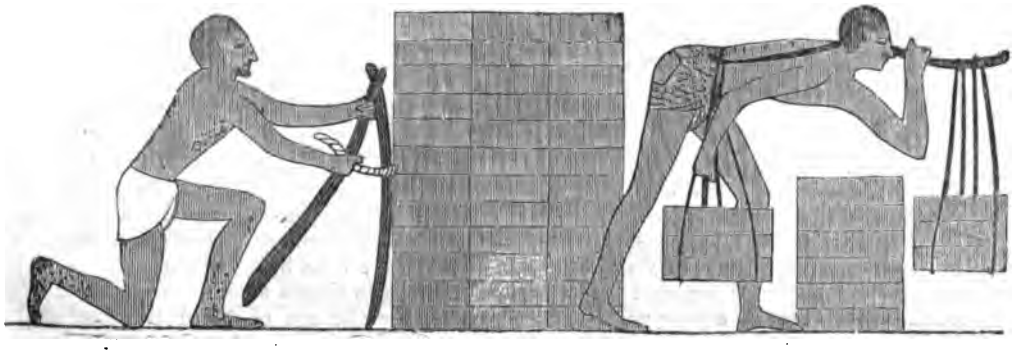
Manetho now becomes our sole guide; he informs us in substance, that a nomade race, settled on the north-eastern frontier of Egypt, invited the Hyksos, who had been anciently overcome and expelled, to return into Egypt, and that these barbarians obeyed the summons, subdued Lower Egypt, and reduced the inhabitants to slavery. Many circumstances recorded in Scripture, lead us to believe that the Pharaoh who tyrannized so cruelly over the Egyptians, belonged to this intrusive dynasty of the Hyksos; he is described as "a king who knew not Joseph," consequently, he must have been a stranger unacquainted with the benefits which Egypt had derived from the enlightened administration of that patriarch, for it is scarcely credible that any native Egyptian could have been ignorant of those circumstances. This Pharaoh also asserts, "the people of the children of Israel are more and mightier than we;" which is scarcely credible if it be understood of the whole body of the Egyptian nation, but it is very possible, nay very probable, that the savage race of conquerors may have been inferior in number to the smallest division of the races which inhabited Egypt. At this very hour, the Turks are the least numerous part of the Turkish population, and the jealousy with which they consequently regard all the other races subject to the Sultan, is the greatest obstacle to the regeneration of their empire. Finally, one of the tasks which this monarch imposed on the Hebrews, was the erection of treasure cities, that is, fortresses to secure the plunder which had been wrested from the native Egyptians. When Joseph, under a native Pharaoh, had received all the money of Egypt in exchange for corn, we do not find that he was compelled to erect any fortresses for its security; such a precaution was necessary only under the iron rule of a barbarous foreigner and conqueror.

The tyranny of Pharaoh commenced by his setting "task-masters" over the Israelites, "to afflict them with their burdens." We find many representations of these cruel task-masters on the monuments; they are armed with formidable whips.

"The Egyptians made the children of Israel to serve with rigour, and they made their lives bitter with hard bondage, in mortar and in brick, and in all manner of service in the field; all their service wherein they made them serve, was with rigour." (Exod. i. 13, 14). The manufacture of bricks was so very toilsome and painful an employment, that it was usually the work of slaves and captives. Among the monumental paintings, we find representations of different races of people employed in this degrading labour. Some of them being bearded, and otherwise pourtrayed with characteristics strikingly different from those of the Egyptians, it can hardly be doubted that the Jews are meant, and such paintings may, therefore, be taken as historical records of the state of bondage of the Jews in the land of Egypt. These representations, too, are the more worthy of note, because, we see some native Egyptians, also compelled to endure the same toil, whence the picture may fairly be regarded as the memorial of a time, when both the Israelites and the native Egyptians were forced to become the slaves of a foreign conqueror, just as both the Arabs and the Fellahs of modern times were equally subjected to the tyranny of the Turks.

The clay before being wrought was tempered with water, and broken into small particles by an instrument resembling the hand-plough, described in a former article of this series. This process was equally painful and unwholesome under the burning sun of Egypt, where the moist exhalations from humid clay have always been found very deleterious.

When the clay was properly tempered, it was moulded in a shape, as is still the practice in the modern manufacture of bricks. Indeed it is scarcely possible to avoid remarking, how very similar the processes of the necessary arts of life, represented on the Egyptian monuments, are to those which we see every day around us. It does not appear that the Egyptians burned their bricks, though, as we shall hereafter see, they were acquainted with the use of



kilns. They preferred drying them in the sun, a custom not wholly disused in Britain, though the lower temperature of our climate renders it far less efficacious than in Egypt. The piling of the bricks, and the mode of their transport, are represented in the accompanying engravings.

A VISIT TO THE SCHOOL FOR THE INDIGENT BLIND, IN ST. GEORGE'S FIELDS, SURREY.

IT is an old and common remark, that places and objects of interest which we have constant opportunities of visiting, frequently remain unseen, and are, therefore, unknown to us, except from the reports of others. It is equally true, that in order to form a just estimate of many of the admirable institutions with which this country abounds, it is necessary to make a personal inspection of them. The quantity of accurate information which is thus derived from the fountain-head, cannot but be improving to the mind; nor does it fail to increase the materials for profitable and engaging conversation. But we are not ashamed to own, that a far better result is, or ought to be produced, by such scenes as we will now endeavour to describe. The heart is touched: every benevolent feeling is called into play: with pity for the distressed is mingled the joy at witnessing the mitigation of their sorrows: a sentiment of gratitude arises to the Giver of all good, for the several compensations He has granted in special cases of infirmity, as well as for our own positive blessings: and, above all, the effect on the kind and thoughtful visiter will be a desire to aid, according to his means, in the glorious work of Christian charity.

These remarks have been suggested by a survey I have just made of the School, established in 1799, for the support and instruction of the Indigent Blind. The object of this Institution is to teach the inmates a trade, by which they may be qualified to provide, either wholly or in part, for their own subsistence. Applicants who have a greater degree of sight than will enable them to distinguish light from darkness, cannot be placed on the list of candidates for admission. Of the description of persons totally blind there are now sixty males and sixty-two females in the school, some of whom were born blind; others, whose claim on the compassion of their fellow-creatures is stronger, and more affecting, from their having once possessed the precious gift of sight, and lost it by illness or accident.

After passing through the rooms of the new building, which is a very handsome fabric, calculated, when finished, to accommodate an increased number of pupils, I entered a large apartment in which the males, ranged at intervals along each side, were busily occupied in making baskets, of different degrees of texture, large hampers, cradles, &c. It was impossible not to be struck with the air of cheerfulness which pervaded the forms as well as the faces of these persons; so that seeing them active and industrious over their respective tasks, one might easily forget, for a time, their peculiar privation. The predominant expression, however, in their physiognomy is repose, or tranquillity of features, owing, probably, to their regular habits, and freedom from a variety of those disturbing causes which necessarily operate upon the many, particularly in the busy pursuits of a large and crowded city. In the basket-room I noticed only one painful instance of unfitness for even the easiest branch of work. It was that of a poor youth, whose brain seemed to be oppressed, and whose mental ray was probably dimmed, if not extinguished, by the same cause that had produced his physical blindness.

I next proceeded to an apartment belonging to the Shoemakers, some of whom were learning their craft from superintendents appointed for the purpose; while the majority showed a readiness and execution which were perfectly astonishing. A strong well-finished shoe was placed in my hands, which I thought would have served any gentleman's foot this wet wintry day; while the smiling artist, whose name, if I remember right, is Wallenger, had the fellow to it on his lap, nearly completed.

The impression being fresh upon my mind, I now venture, at the hazard of wearying some of my readers, to mention the Mat-room, where all sorts of brown and white rope door-mats, fine bright mats, bordered with coloured worsted, worsted rugs for hearths and carriages, were being carried on in such a regular and business-like style, that if, for a moment, in admiration of the articles, I ceased to remember the condition of those who wrought them, I was instantly reminded of this truth,—"That where one sense is defective, another is generally more perfect." So delicate is the touch of these blind persons, and so strikingly do they illustrate that wonder, to which public attention has recently been called in a remarkable manner,—the wonder of the human hand!

But it is time to say a few words respecting the female part of this excellent Institution. The girls were all assembled in a large airy room, and employed in knitting stockings, in needle-work, and in preparing household linen, and linen for the scholars. A few of them were as busy as bees, in platting a singularly-constructed patent sash-line, clock and clothes-lines, on a machine adapted to the use of the blind. I was informed, that since the first manufacture of these different kinds of line, a very material improvement has taken place, and that the sash-line, thus made, has been approved by eminent builders.

From a review of this slight sketch of the steady career of industry within these walls, the reader will learn with more gratification than surprise, that the articles made in the year 1836 by the hands of the blind persons, were sold for 1790*l.* 17*s.* 6*d.*

On passing through a gallery to the room in which the females were assembled, I was pleased to hear the sound of sacred music growing more and more clear; till, on entering, I distinguished the words of the 149th Psalm, beginning,—

> O praise ye the Lord,
> Prepare your glad voice!

which was well sung by the blind girls in the midst of their work. One of them,—who was pointed out to me by my benevolent guide as a very good girl,—afterwards, on being requested, *threaded her needle* much more easily, as I told her, than I could have done. She smiled, and modestly answered, that she had been for some time in the school. Another young woman, whose sight had been destroyed, about three years since, by the shameful heedlessness of a fellow-servant in firing a large pistol at her, unconscious of its being loaded, assured me, that God had been very good to her; that she was entirely reconciled to her lot, and contented in the station which she now filled. This declaration from her own lips was peculiarly gratifying, because I remembered her forlorn and desponding condition at about the time the accident occurred, when she thought she never should have been happy again.

I was now shown some books, printed in embossed types, for the use of blind persons, and designed

to be read by the touch. The letters in the several specimens were of various character; but of all the different plans, the simplest struck me as the best. This was Mr. John Alston's, the Treasurer of the Glasgow Asylum for the Blind, who has recently added to that Institution a fount of types and a printing-press, and has completed the whole of the Four Gospels in relief, in two large quarto volumes, at 9*s*. 6*d*. per volume. The teaching of the blind to read has engaged the attention of the benevolent for some time past: and Mr. Alston's plan, which consists in using the common Roman capitals, sharply-formed, has proved the most successful; the children, if tolerably apt scholars, learning it in a very short time. Thus, though "knowledge is, by one entrance, quite shut out," they are instructed in the inestimable truths contained in the word of GOD.

Their hands can read, their fingers trace
The page of Truth and Love;
And thus they joyfully embrace
The message from above.

The most affecting part of the visit, however, yet remained. I well knew the taste for music possessed by blind persons generally; indeed it has frequently been a pleasure to me to reflect, that such a delightful resource should have been placed so completely within their reach. "The Hymn of Eve" was played and sung correctly, and with considerable feeling. After a short pause, one of the girls was desired to recite that beautiful chapter of Isaiah, beginning,—"Ho, every one that thirsteth, come ye to the waters, and he that hath no money; come ye, buy, and eat; yea, come, buy wine and milk without money and without price." As soon as she had ended, one of her companions repeated with just emphasis, and in a pleasing tone of voice, the 8th chapter of St. Paul's Epistle to the Romans; and certainly two portions of Scripture more consolatory, or more abounding in passages of deep and universal concern to all, be their outward circumstances what they may, it would be difficult to select. The 18th verse sounded uncommonly affecting:—"For I reckon that the sufferings of this present time are not worthy to be compared with the glory which shall be revealed in us." All, or nearly all, the female pupils, as I was informed, know the Psalms, (the prose version, used in our Liturgy,) throughout, and some can repeat any part of the Four Gospels. Listening to the inspired passages, my mind stretched onward to the period, when this mortal shall have put on immortality, and to that city which hath "no need of the sun, neither of the moon to shine in it; for the glory of God doth lighten it, and the LAMB is the light thereof; for there shall be no night there." In that perfect day, thought I, shall not this desolate being, who walks by faith now, be gifted with a clear view of the Divine majesty; whilst many of those, who, humanly speaking, are walking by sight, and whose inward gaze of a future world is dimmed and uncertain, shall be pronounced blind? Yes; although, independently of their privations, these sad objects doubtless have their trials; yet, removed as they are from the temptations of a densely-peopled and vicious metropolis, brought up in regular habits, taught to read and to pray, they possess privileges, they enjoy advantages, the value of which it is difficult to calculate. With such reflections, I listened with pleasure to the following lines composed by one, who, if I mistake not, was formerly an inmate of the School, and addressed to the friends of the Institution. I never can forget "the deep, the low, the pleading tone," in which they were recited. And with these I shall conclude my narrative.

FROM Chaos sprang the teeming Earth,
At the Divine command;
And the untiring Sea had birth,
'Neath the Almighty hand.
But darkness lowered upon the deep:
Creation's first, long, silent sleep
Still hid the world in night:
Till, with a voice that pealed through space,
From His most high and holy place,
God said, "Let there be light."

"And there was light!" and with it grew
The glory of the day;
The vast, the wonderful, the new,
Were seen beneath its ray.
Not hidden was the meanest root,
The lowliest flower, the humblest fruit,
All burst upon the sight:
For unto each, as if to prove
His universal care and love,
The Lord had yielded light.

Praise be to God! another ray,
Not less divinely given,
Points, through his blessed Son, the way
To happiness and heaven.
And thus your boundless charities
Have spread before our sightless eyes,
Locked in eternal night,
That holier radiance, mild and pure,
Which makes our soul's salvation sure,—
The glorious Gospel light!

We cannot thank you as we ought,
But were our hearts laid bare,
You'd see each fond and grateful thought
Pour'd out in silent prayer.
And when we meet before the throne
Of Him to whom all deeds are known,
How shall we hail the sight
Of the pure glory, that will bind
The brows of those, who taught the blind
To seek the living light!

M.

AMUSEMENTS IN SCIENCE.

No. V.

ARITHMETIC.—Part 2.

WE all know that if a cipher be added to any number of figures, the effect is the same as if they were multiplied by 10: if two ciphers be added, the same as if multiplied by 100. On the same principle, to multiply by 11, place a cipher at the end of the number to be multiplied, and the original number itself immediately under; then add them together, and the answer is obtained. For example, to multiply 368,426 by 11, do thus—

3684260		368426
368426	or thus,	368426
4052686		4052686

NUMBERS which increase by what is termed arithmetical progression, for instance, 2, 4, 6, 8, 10, each succeeding term increasing by 2; or 2, 5, 8, 11, 14, in which the terms increase by 3, or any other number, possess some curious properties.

In every arithmetical progression, the sum of the first and last terms is equal to that of the second and last but one, and to that of the third and last but two, &c.; or to the sum of the two middle terms, when the number of terms is even; or to double that of the middle term when the number of terms is odd. For instance, if the number of terms are even, as

1, 4, 7, 10, 13, 16,

16 and 1 are equal to 17, and the two middle terms, 7 and 10, are also equal to 17: if the series is uneven, as

1, 4, 7, 10, 13, 16, 19,

19 and 1 are equal to 20, and twice 10, the middle term, produces the same amount. In the last series the

number of terms is 7, and the difference 3; the 7th term is, consequently, equal to the first with the addition of 6 times 3, or equal to 19. This property enables the scholar to obtain the amount of any term in the series, at any distance from the first, by a very simple proceeding. By this last property, we are enabled to show in what manner the sum of *all* the terms of an arithmetical progression can readily be found, for as the first and last terms make the same sum as the second and last but one, and as the third and last but two, &c., it thence follows, that the *whole* progression contains as many times the sum of the first and last as there are *pairs* of such terms. The number of pairs is, of course, equal to half the number of terms, and consequently, the sum of all the terms is equal to the sum of the first and last term, multiplied by half the number of terms.

Let us put the familiar instance of the man who picked up a hundred stones, one by one, placed in a straight line at one yard distance from each other, returning to a basket placed at a yard distance also from the first stone, one hundred times.

It is evident, that to pick up the first stone, and put it into the basket, the person must walk two yards, one in going, and one in returning; that for the second he must walk four yards, and so on, increasing by two as far as the hundredth, which will oblige him to walk two hundred yards, one hundred in going, and one hundred in returning.

It may easily be perceived also, that these numbers form an arithmetical progression, in which the number of terms is 100, the first term 2, and the last 200; by the rule already noticed, the number of yards he has walked is easily ascertained.

Yards.	
2	distance walked for first stone.
200	distance walked for one hundredth stone.
202	sum of the first and last term.
50	half the whole number of terms, or the number of pairs of terms.
10,100	yards.

The distance walked, therefore, is equal to 10,100 yards, or nearly five miles and three quarters.

Under the head of Combination and Permutation, in our books of arithmetic, we have rules given, by which the number of different arrangements which can occur in the order of placing a certain number of counters can be ascertained. By the use of the following table, these operations can be much shortened, provided the number does not exceed 9.

1	2	3	4	5	6	7	8	9	10	
1	1	1	1	1	1	1	1	1	1	1
	1	2	3	4	5	6	7	8	8	2
		1	3	6	10	15	21	28	36	3
			1	4	10	20	35	56	84	4
				1	5	15	35	70	126	5
					1	6	21	56	126	6
						1	7	28	84	7
							1	8	36	8
								1	9	9
									1	10

Suppose it is required to know how many ways 7 counters can be arranged 3 and 3. Look to the perpendicular band of figures in the table, the number at the head of which, is equal to one more than the number of counters to be combined; in this case, it will be the eighth column, seven being the number of counters, Then seek for the horizontal column of figures, whose distinguishing number is one more than the number of counters to be taken at one time, which in this instance is 3, the column, therefore, is numbered 4; by carrying the finger along these columns, until you come to their point of intersection at A, we find the number 35, the number of ways in which seven counters can be arranged by threes.

Two persons agree to choose, alternately, any number less than 11, and to add these numbers together until they shall make 100; by what means can one of them infallibly attain to that number before the other?

100
11
89
11
78
11
67
11
56
11
45
11
34
11
23
11
12
11
1

To effect this, subtract 11 from 100, the number to be reached, as many times as possible; this will give the remainders,—89, 78, 67, 56, 45, 34, 23, 12, 1. By a knowledge of these numbers, the party who writes down the first number is certain of reaching 100 first, if he can count any one of these numbers. Let us suppose, for example, that the first person who knows the game, takes 1 for his first number; it is evident that his adversary, as he must count less than 11, can, at most, reach 11, by adding 10 to it, the first will then take 1, which will make 12; if the second takes 8, which will make 20, the first will take 3, which will make 23; and, proceeding in this manner, he will reach successively 34, 45, 56, 67, 78, 89; when he attains the last number, it will be impossible for the second player to prevent the first reaching 100 before himself.

It is evident that, if both parties understand the game, he who begins must inevitably win.

If a piece of square pasteboard is divided into nine cells, how can the following numbers of counters be placed in the outer cells of the square, as that they all be placed, and yet there shall, in every case, be nine counters, and no more, in each outer row of three cells? The numbers of counters are 18, 20, 24, 28, 32, 36. The following tables resolve this problem, and require no explanation.

5		4
4		5

4	1	4
1		1
4	1	4

3	3	3
3		3
3	3	3

2	5	2
5		5
2	5	2

1	7	1
7		7
1	7	1

	9	
9		9
	9	

READ not to contradict and confute, but to weigh and consider. Some books are to be tasted, others to be swallowed, and some few to be digested; that is, some books are to be read only in parts, others to be read, but not curiously; and some few to be read wholly, and with diligence and attention. Reading maketh a full man, conference a ready man, and writing an exact man.—LORD BACON.

HE that wants good sense is unhappy in having learning, for he has thereby only more ways of exposing himself; and he that has sense knows that learning is not knowledge, but rather the art of using it.—*The Tatler.*

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A BRIEF HISTORY OF NAVIGATION.

PART I.
ON THE NAVIGATION OF THE ANCIENTS.

RUDE as their ships was navigation then,
No useful compass or meridian known
Coasting they kept the land within their ken,
And knew no North but when the pole-star shone.
DRYDEN.

EGYPTIAN POTTERY-FLOAT.

INTRODUCTION.

THE contemplative mind is supplied with matter for moral, and even sublime reflection, in viewing man in his more natural state, weak, savage, and untutored; clad in the skins of animals constituting his food, which are captured with toil and difficulty; inhabiting a rude hut, and confined within the narrow range of an island girt by the ocean, which to him is interminable; knowing no other land than that on which he dwells, and never daring to lose sight of that land, in the frail bark in which he moves along his native coast. Then if, by a rapid transition, we behold man civilized and highly cultivated as he now is, borne along by—

The heaven-conducted prow
Of Navigation bold, that fearless braves
The burning line, or dares the wintry pole,

we feel the force of the oft-repeated truism, that man is a progressive being. Thus, it will furnish instruction to the reader, if we endeavour to fill up the long interval between these two conditions, in which we find man acting his part as a member of the human family, by tracing the progress of Navigation from the rude raft, or ill-constructed canoe, through the various stages of addition and improvement, until we reach that triumphant monument of human skill,—a ship of the line*. An improvement, so vast, is of course only one of the results of the advancement of nations in the scale of civilization; and this advancement is accurately tested by their collateral progress in literature, art, and science. As the first ministers to the reflecting tastes of its members, so the two latter supply their actual wants and increasing desires; and there have been found, at all times, persons ready to devote their energies to carry out those subjects, which a few fortunate and gifted individuals have invented, or improved. But the great bulk of mankind does not the less further the progress of civilization, though all do not invent nor improve: they serve as the power for carrying on the work, which is contrived and begun by that limited number of great minds, on which Nature has poured down her choicer gifts.

While thus laborious crowds
Ply the tough oar, Philosophy directs
The ruling helm.

In the present and succeeding papers it is our purpose, therefore, to trace the progress of Navigation from its earliest principles and practice, to its present comparatively perfect condition; and in doing so, it will be found convenient to adopt the following arrangement, and treat—

1st. Of the Navigation of the Ancients.
2nd. Of the Navigation of the Middle Ages.
3rd. Of Modern Navigation.

The first division will comprehend, as to time, all the period between the creation of the world and the downfall of Rome; that is, a space of about 4500 years.

ON THE RUDIMENTS OF NAVIGATION, TO THE FORMATION OF THE BOAT.

WHEN speaking of Navigation in the earliest stages of the world, the idea of the ark, used by Noah and his family, will readily enter into the minds of our readers. But we cannot consider the formation and use of the ark, in the seventeenth century of the world, as a commencement or link in the chain of nautical invention. The entire direction and means for accomplishing this stupendous work, were afforded by God, to effect a saving purpose in the midst of the miraculous destruction of the human race; when the power and skill of man would have been, in those times at least, impotent to withstand or elude the watery havoc of Nature. In addition to this, we must notice the absence from the ark of any means, or of any necessity, for its occupants *navigating* it from one place to another; which is essentially necessary to make it belong to our present subject. No intention of this sort is alluded to; the ark being merely a vast shelter rendered capable of floating on the water. For these two reasons, therefore, we conclude against assigning to this event in the sacred history, a place in this treatise.

We come, then, to regard the ocean as a part of the arrangement of the Almighty power for His own wise purposes; as among the *creatures*, which have been committed to the use of man; beneficial in various ways, which it is not our province to consider here, but only as it serves the purpose of a great high-way for the nations of the world; pre-eminent among which, and may it ever be, is our own country. Our subject takes not in its view a supernatural state of the floods of the ocean, but that, wherein there is "set a bound that they may not pass over; that they turn not again to cover the earth*." We contemn, therefore, the quailing lament of the heathen poet, Horace, who thus delivers himself:—

Jove has the realms of earth in vain
Divided by the unhabitable main,
If ships profane, with fearless pride,
Bound o'er the inviolable tide.

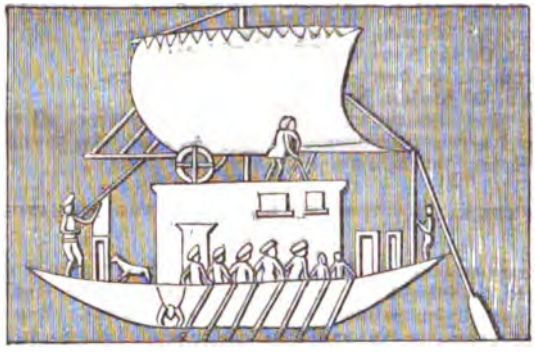
We see how ill-timed is this awe of the sea, when we remember as readers of the Inspired Volume, that it is written,—"They that go down to the sea in ships, that do business in great waters; These see the works of the Lord, and his wonders in the deep †:" and, when we call to mind, that, by means of ships, this Inspired Volume was brought to us, and has been carried out again to all parts of the habitable earth.

In the youthful condition of the world, and when all was new and untried, the innate love of exploring that which had not yet been seen, gradually extended the locality of the human race. Brooks, and such like streams, were soon forded, when new pastures, the impulse of hunting, and the

* See *Saturday Magazine*, Vol. III., p. 36.

* Psalm civ. 9. † Psalm cvii. 23, 24.

desire of novelty, prompted a change; and a mode of crossing the deeper streams was soon suggested to the observation of the savage, whose condition seems, by the testimony of Homer, to have been at its lowest pitch, when in ignorance of any means whatever, for crossing the water, which, though seeming, at first sight, to bar intercourse, does, in reality, promote it. The buoyancy of wood in the water is the germ of all his subsequent proceedings. Accident shows him that wood invariably floats; and on the fallen trunk of a tree he ventures, beyond his own depth, away from the land. The trunk of a tree, hollowed out, for a more convenient position of the body, (an idea derived, we are told, from a split reed, seen floating on the water,) forms the canoe, which is usually found among the most uncivilized of the human species. From this rude beginning to the noble vessels of our day, how great the interval of time, how slow the pace of improvement, and how absolutely necessary, for any permanent and comprehensive effect, the application of elements, which seemed at one time out of the reach and cognizance of man.



ANCIENT PICTURE OF AN EGYPTIAN SHIP.

We seem to learn from contemplating the first materials of antiquity, that man derived, from the natural objects which surrounded him, a notion of the forms and fashions of things which conduce to his benefit. The pitcher-flower, (*Nepenthes distillatoria,*) * presented to him a graceful and convenient form for his cups and vases; the leaf-covered grottoes infused into him the idea of arranging his architectural principles on the patterns of nature; and the movements of the finny tribe developed the secret of directing his path on the water with nearly the same ease as on land; the trunk of the tree hollowed out, as a receptacle for the navigator, accords with the body of the fish; the forepart of this trunk, when sharpened off to an edge, in order to cleave the waters the more easily, is assimilated to the head of the animal, while the forcible motion of its tail shadows out the rudder, which, by its lateral movements, serves the purpose of steering the boat, as the tail of the animal directs the motion of the fish. This step in Navigation is completed by adopting a method for propelling the vessel onwards, which method is furnished by seeing the use of the fins of the fish in forming a passage through the waters. When oars, sculls, or paddles came into operation at the instance of Atlas, an ancient African monarch, the *boat* was essentially complete.

The foregoing illustration condenses into one view the various traditions, which have been handed down respecting the first decided step in Navigation; for it matters little from what other quarter,—the swan, or any other aquatic fowl,—the suggestion arises to the human mind, so it agree with the beauty of nature in its physical utility.

The *raft*, or floor of wood, formed by the lashing together of two or more planks, seems to have been an early, as it is one of the readiest modes for passing and conveying rough goods along upon the water. In time of shipwreck, or for any temporary purpose of transport, its facility of make recommends it, when other modes fail. Thus Hannibal used rafts for transporting his horses and elephants across the Rhone. The Egyptians, in very early times, used the raft on the Nile. An improved sort of raft was found in use among the Peruvians, tapered at the prow, in order to pass through the water more easily; the planks were fastened together with leather thongs, by the unnoticed decay of which the bark would oftentimes fall to pieces, and its mariner and goods disappear under the waves. The celebrated timber-raft which floats down the Rhine to Dort, in the Netherlands, from the forests of Germany, is oftentimes 1000 feet long, and 80 or 90 feet wide, consisting of trees fastened together with iron spikes and cross-timber,—a floating island with a village at the top, and requiring nearly 500 labourers to manage it. When the raft is broken up and sold, it sometimes fetches a sum of £30,000. The same practice is used on the coast of Norway, thereby saving the trouble and expense of land-carriage.

On a board, or slight raft, the surf-swimmers of the Sandwich Islands, in the Pacific Ocean, pursue their pastime. They swim out to sea on this raft through a violent surf, plunging under every wave, and rising beyond it. In returning they are carried swiftly on the top of a large wave towards the shore, when they steer among the rocks, taking care not to lose their planks, for such a loss is deemed to be very disgraceful.

Somewhat superior in contrivance and effect is the construction of the pottery-floats of Egypt. Jars and various earthen vessels are made in great quantities in Upper Egypt; a large number of them are fastened together with cords and twigs into a triangular shape, having the mouths of the vessels upwards; they are then covered with bulrushes, and, being empty, are rowed as need may be, and steered down the Nile to Cairo, where the raft is taken apart and the articles are sold. Some remarks on these earthenware boats may be found in Vol. IX., p. 164, of this work.

It appears that, in very ancient times, a vessel was in use on the Nile, made from the planks of acanthus wood, so laid together as to lap over in the manner of tiling, and fastened with wooden pegs, the seams being tightened with leaves. It was also covered over with flags of the papyrus, and properly cemented, to keep out the water. In process of time an acanthus mast was added, to which was appended a sail, formed of papyrus leaves. This was the case in the infancy of Moses, and to such the prophet Isaiah alludes in the second verse of the 18th chapter of his book. In ascending the Nile the vessel was towed along; in its descent, it was steadied against the effects of the N. E. winds by a hurdle of wood let down from the prow.

By the term *canoe* is generally meant a single tree hollowed out boat-like, propelled onwards in the direction of the view of the Indian, who urges its course with paddles, which are worked perpendicularly in the water. The Macedonians, who saw the natives at the mouth of the Indus paddling in their canoes, thought they were digging the water with spades. Canoes are of various lengths, from 10 to 50 feet.

But the make and build of all the early naval structures depended simply upon the use they were put to, and the means at hand for their formation. We have from Herodotus the description of a vessel for conveying goods down the Euphrates to Babylon. A frame-work of willow was covered with skins, forming, when complete, a sort of large tub, which was managed by two men with long poles, without any regard to stem or stern. They were of various sizes, and carried an ass besides the merchandize; the animal was employed in conveying the vessel home by land when taken to pieces, as the downward force of the river's current prevented them from sailing up the stream. Major Rennel describes this vessel as being still in use in the lower parts of the river, under the name of KUFAH, or *round vessel.* Very similar to this is the *coracle*, consisting of a large basket, over which was stretched a horse's hide. This was found among the ancient Britons when the Romans invaded the island, and is still seen in use on the Severn, and among the people of South Wales. The American Indians use wooden-ribbed vessels, covered with skins, which vessels, owing to their lightness, can be carried overland, when it is necessary to avoid the rapids and waterfalls, which are numerous in the country. The Greenlander's canoe is covered in at the top with a skin, so as to shut up the lower part of his body when he is sitting in the vessel; the water may thus be kept out in the roughest seas.

The double canoe of the Society Islands is an ingenious contrivance for affording a safe platform, whereon the warriors may wage battle. Two canoes being placed alongside of each other, at a certain distance apart, planks are firmly fixed across, which make a stage safe from capsizing. The whole is so contrived, that the rowers may work underneath this floor, while the soldiers engage in battle above.

* See *Saturday Magazine*, Vol. II., p. 159.

The proas of the Ladrone Islands present another form of the canoe, the peculiar quality of which, we are told, is swiftness to the extent of 20 miles an hour; this results from their construction. The lee side, or that which is away from the wind, is straight, while the other is bowed out as usual. This causes both ends of the vessel to be narrow, and thereby exceedingly sharp, so that it pierces through the water the more readily, and needs no turning round when the voyager wishes to come back. In a rough sea they have a contrivance on the windward side of the proa called an out-rigger, (see Vol. III., p. 181, of this work,) to preserve a steady balance, and prevent its upsetting on the straight or lee side. The rapid motions of the sword-fish would seem to have suggested the idea of forming these *flying proas*.

The alder and poplar were used by the ancients for ship-building, as being hard and light woods, but oak and fir were chiefly sought after. The Greeks used chestnut and cedar, the latter of which they considered to be very durable. Cypress was valued for its not leaking, and elm was chiefly used for the parts of the vessel under water. Sometimes, in these days of nautical simplicity, a fleet of ships was formed within a month of the time when the timber spread out its leafy arms in the forest, haste, not skill, being used in their formation. When, however, time allowed, ship-timber was not always hastily felled, nor carelessly employed. The age of the moon, and the quarter from which the wind blew, were superstitiously heeded.

Tacitus describes the Swedish boats, seen by the navigators of his time, as being like the Northern yawls of the present day, which are peaked at both ends. These boats were, in all probability, used for piracy, which in a barbarous condition of society, is the mode of gradually establishing commerce. A galley, the prow of which resembled the weapon of the sword-fish, was used by the ancient Greeks, as also in more modern times, for cruising against the pirates of the Mediterranean, whose vessels were of a similar sort.

The materials with which the planks or other parts of these different vessels were put or fastened together, were various. Sometimes wooden pins were employed, and at other times they were connected together with thongs, made from the skins and sinews of animals; iron seldom, or never, coming within the reach of these primitive naval architects. The Icelanders and Esquimaux Indians were found to make their boats of long poles placed crosswise, tied together with whale-sinews, and covered with the skins of sea-dogs, sewed with sinews instead of thread. To stop leakage the ancients used lime and pounded shells, which being observed to waste away, pitch, resin, and wax were employed. Sometimes the crevices were first stopped up with flax, and then leather was employed for sheathing. We find sheet-lead used for the same purpose, and copper nails. For their tools they used flints and shells for cutting, while several of the bones of fishes served them to pierce, to saw, and to plane with. From these nature-suggested implements is derived, with improvements according to circumstances, a great portion of the tools with which the mechanic of modern days so skilfully performs his work.

ANCIENT ROWING-BOAT

We arrive now at the general term of *boat*, by which we understand a combination of every peculiar excellence afforded by each sort of water-conveyance mentioned before. The method of making and finishing off a boat is to be sought for in the science of Naval Architecture; but we may merely mention that, from the lightest and most substantial material, strongly compacted into the form which will attain most speed, and admit of most room and convenience for the rowers, whether they be one, two, or more, is produced the most finished specimen of the first and original class of naval structures.

THE SAIL.

About 1230 years before the Christian era, as far as we are able to discern actual fact through the hazy and fabulous record of profane antiquity, the adoption of *sails* promoted the nautical art beyond former conception, and served as an era in history by the simultaneous wonder and admiration with which the discovery, and the authors of it, were hailed by their fellow-men, whose knowledge and comfort were, in process of time, so much promoted thereby. The statements of the early writers of the world seem to concur in describing Dædalus of Athens, the most skilful mechanician of his day, as the individual who first pressed the wind into the naval service of man. His genius, sharpened by fear, when seeking to escape the vengeance of Minos, king of Crete, put up in his own boat, and in that of his son, a cloth, or cloths, to catch the passing gale, thus using its force to hasten on their frail barks. The singers and bards of the time, whose avocation was with the multitude, and whose recitations pleased in proportion to the quantity of the marvellous they contained, being themselves, from the very nature of their pursuits, easily led off from natural principles to the sublime and mysterious, chanted before those, whom rumour had already prepossessed, the flight of Dædalus and the unfortunate death of Icarus, his son. Dædalus, say they, had carefully fitted to his own body, and to that of his son, wings, constructed with feathers and wax. Thus equipped, they took their flight through the air over that part of the sea which lay between Crete and Italy. Icarus, with the rashness and unsteadiness of youth, sought a higher flight than his sire, and getting, in consequence, too near the neighbourhood of the sun, the waxen cement of his wings was loosened, which, thus becoming powerless, he dropped into and was drowned, in that part of the Ægean Sea, or Archipelago, which bore for ages after the appellation of the Icarian Sea. The point in this relation which we are chiefly interested in clearing up, is the youth's mismanagement of his wings. The fact of the passage of one of these persons from Crete to Italy, and the drowning of the other, is undisputed; also that they went over the water and not over the land. As we know that it is incompatible with the human frame to be buoyed up by wings in the air, and unnatural that greater heat should be experienced in rising above the surface of the earth, balloons being at that time out of the question, and being aware of the stretch and license which the rude and unreflective imagination can take, we see easily that Dædalus and Icarus, by cutting their way through the waters with sails swelled out by the wind, seemed to have flown over it with wings; and this the more veritably to those who regarded only, or chiefly, the novelty of the proceeding, and received their accounts from the echo of rumour. The vessel of Icarus then, who seems not to have had his sail sufficiently under control, was capsized, and thus, as truly said in the fable, "he dropped into the sea, and was drowned."

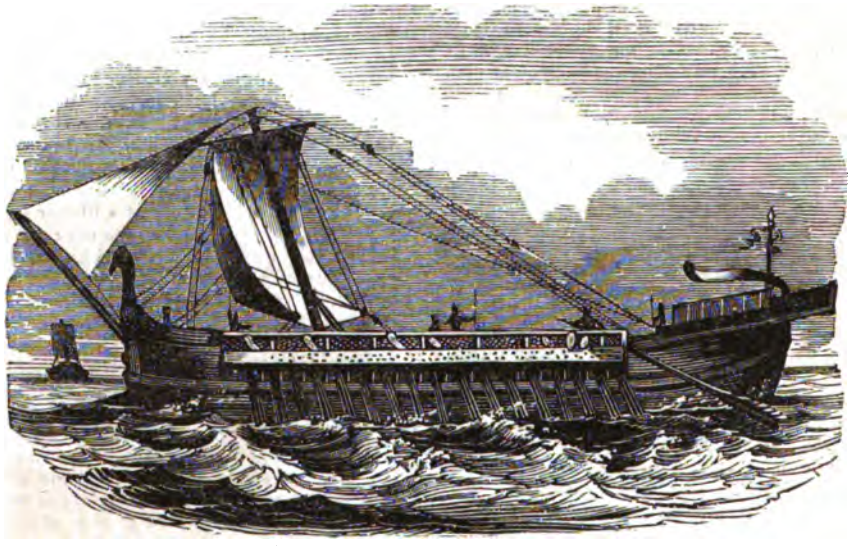
Many other voyages, under circumstances so novel for the times, have received the utmost embellishment of the poetic art. When we consider the surprise of ignorant people, at beholding floating castles with expanded wings, making their unassisted way over the sea, we discern easily whence arose the fiction of the flight of Perseus to the Gorgons, who, we are told by Aristophanes, was carried thither in a ship. The story of Triptolemus, who was feigned to ride about the world on a winged dragon, doing good to the human race, is easily understood, when we remember that he was employed by his countrymen to procure in a ship corn from foreign shores, for the supply of their necessities. The winged horse, Pegasus, was a ship of that name, fabled to have been the offspring of Neptune, the god of the sea. In a word, we thus account for the stories of griffins, or of ships transformed into fishes and birds, so frequently met with in the ancient poets.

It is probable that some natural object, such as the wing of a bird, suggested the idea of the sail. By some it has been referred to the *nautilus*, or sailor-fish, which is seen in the Mediterranean Sea, the Indian Ocean, and the Polynesian waters of the Pacific. It is oftentimes observed in calm weather floating on the surface of the water, using its side-fins as oars, its hinder one for steering, while its dorsal-fin, which is formed from a peculiar membrane, serves as a sail. When wishing to go down all is drawn in, with a sufficient quantity of water to make it specifically heavier than its own bulk of water, it then sinks in an instant: when wishing to rise again it ejects the water. (See Vol. VI., p. 149.)

The material of which the sail was usually composed was linen, or it depended upon the particular produce of the country which despatched a sailing vessel from its shores. A sail was, perhaps, at first most readily formed by the mariner's suspending his clothes upon a pole. In some countries they used leather, or skins of animals, for sails, as Julius Cæsar observed the Gaulish Venetians to do. Thus Hercules is said to have sailed with the back of a lion, because he used no other sail than his garment, which was the skin of a lion. In other countries they used sails made from twisted flax or hemp, as the native West Indians are found, at the present time, to use in making a sail, a sort of silky grass, plaited to the length and breadth required.

We do not find more than one sail used in the earliest ages, or more than one mast; their vessels had not even a deck. The sails were commonly white, which colour was esteemed more lucky, though sometimes they were of other colours. The vessels were painted red and sometimes blue, which latter colour was intended to correspond with the cerulean appearance of the sea, in climes where the blue sky overhangs the watery expanse, undimmed by clouds and vapour. When we read of the black ships of Homer, we must remember that they took this appearance from the pitch, with which they were externally covered to exclude the water. Sometimes other materials were used to produce the same effect, and hence a diversity in the colours of the ships. Such was the sort of vessels which conveyed the allied army to the plains of Troy. The size and number of the sails increased with the magnitude of the vessels and the length of their voyages, all which depended upon the importance of the nation, which, in the progress of time, by the searching spirit of commerce, or the desire of conquest, advanced the maritime arts.

The form and disposition of the sails in the vessel have been found to be different in different countries. We are told that, in ancient Egypt, the sail was suspended on two upright poles, so that it could be used only before the wind, as is the case with many of the South Sea Islanders, whose sails are made of matting. The sails of the New Zealanders and Polynesians are found to be of a triangular form, the former having the base upwards and the latter downwards; and, in a general view of the case, the condition of the savage state in our times will be found very much upon a par with that of early antiquity, at least as far as art and science are concerned, which consideration must be kept in view, if any question should arise in the reader's mind, as to why we seem to treat of the naval pursuits of modern barbarians in conjunction with those of the people who lived before the Christian era



GALLEY, FROM A PAINTING AT HERCULANEUM.

THE RUDDER, ANCHOR, CABLES, SHIP'S NAME, &c.

Before proceeding to consider the more perfect condition of ancient Navigation with reference to its effects, we shall present a brief view of some of its appendages in detail.

The rudder serves to regulate the course of the ship, as the tail of the fish guides the motions of its body. The principle is the same in both cases. When the rudder is in a right line with the central direction of the vessel, it is merely an enlargement of the keel. When drawn towards either side, it has to make way against a force of water, the resistance of which is in proportion to the angle formed by the rudder and the keel, and the rate of propulsion at which the vessel is urged along, or to the force of the surrounding current; so that the *stern* or hinder part of the vessel is forced aside out of its place by the resisting water, and the *prow*, or forepart, consequently, assumes an opposite direction, according with the movement of the rudder.

It seems that the original rudder was nothing more than one of the oars or paddles held sternwise by the person in the boat, which natural observation and practice taught him to steer the vessel by. This practice is even now far from obsolete. The ancient Greeks, we are told by Homer, used only one rudder; but as their vessels enlarged in size, they used two, one at the prow and the other at the stern: connected therewith by fastenings, termed *rudder-bands*, allu ded to in Acts xxvii. 40; so that these were called *double-stern ships*, and could be propelled either way, without turning. Tacitus relates that the Germans used vessels of this sort. The use of the rudder-bands was to fasten the helm up out of the water, when the ship was left to drive, or take its own course; but, if they were loosened, as St. Luke relates, the rudder dipped into the water for use. We read of four rudders being employed, but nothing definite seems to be known of ships of this sort; nor of ships, which are mentioned as having two prows and two sterns.

It is a general feature in the maritime affairs of ancient nations, that their vessels in general could be conveniently carried overland, when so doing would tend to lessen distance; and for this purpose they were oftentimes so constructed, that they could be easily taken to pieces; as was often done, when they wished to pass over an isthmus. They were also drawn up out of the water, even for a single night. Hence, it is clear, that they were for a long time, at best, but sailing-boats; and that the anchor was not needed. The need or convenience of this grew with the size of the vessel. The Tuscans are said to have invented the anchor, while some ascribe it to Midas, whose anchor was long preserved in one of the temples of Jupiter. But, whatever means may have been originated by any party to

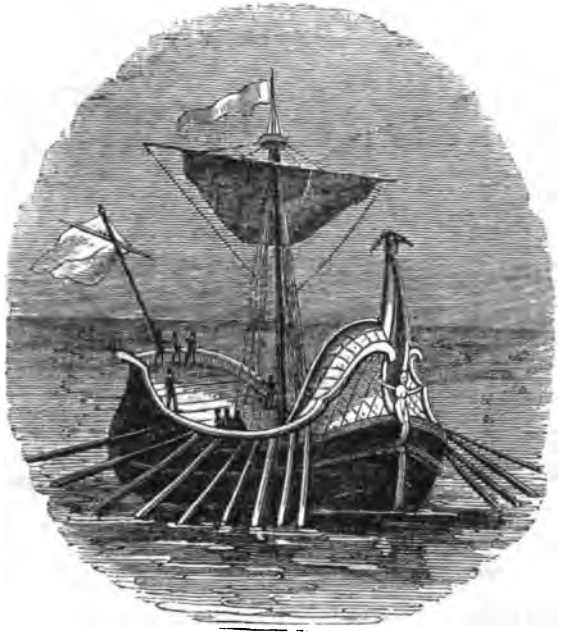
stay their vessels on the water, though the effect obtained was always the same, the instrument was various. The most ancient anchors were large stones, bored through the middle; sometimes they were made of wood, having lead inserted. In some places, baskets of stones, or sacks of sand, suspended by cords in the sea, served as anchors, by impeding the course of the ship by their weight. At length the anchor was made of iron, with one tooth, or fluke; and soon after two-fluked anchors became general. Sometimes they employed an anchor with four claws, or flukes; which seems to be what is meant in Acts xxvii. 29; although the ancients used more anchors than one, and usually dropped them by boats from the stern, contrary to the practice of the moderns, who let them down from the prow. The boat, being fastened to the stern, was usually towed along after the ship, unless in case of a heavy sea coming on, when it was drawn close up to the ship; as in Acts xxvii. 16. We learn from Bruce that the four-fluked anchor is still used by the Egyptians; and we should observe that St. Luke mentions that St. Paul was voyaging in an Egyptian vessel. Of the several anchors belonging to each ship, one exceeded the rest in size and strength. This was called *the sacred anchor*, and was used only in extreme danger; so that the phrase, *to throw out the sacred anchor*, was in process of time proverbially applied to those who were driven to their last shifts.

We find, upon one or two occasions, mention made of iron chains in use for dropping the anchor. Cables, however, were generally employed, made at first from leather thongs, or the sinews of animals. They then used flax, hemp, broom, rushes, or sea-weed. The ancient Greeks procured from Egypt ropes and cables manufactured from rushes and sea-willow. We must not omit to mention the ancient practice of *undergirding* the ship, mentioned in Acts xxvii. 17. By this is meant the passing of ropes several times round the hull, to prevent the timbers from starting and giving way, when the ship, in a very rough sea, is strained, and apt to lurch. It is even done now, upon occasion, when the vessel is not very large; as we find in Walter's account of Lord Anson's voyage, who relates the undergirding of a Spanish ship with six turns of a cable, during a violent storm.

It seems to have been the ordinary practice of the ancients, to place at the head or prow of the vessel an image, called the sign; which we see also in modern times. This gave then, and usually gives now, a notion of the ship's name. The sides of the prow were called *cheeks*, as this part of the vessel generally showed a human face, and was decorated with paint and gilding (see the engraving in page 35). The part of the vessel which cut the water, was called the *goose;* a great similarity being fancied to exist between the ship and this bird, while on the water. At the stern, often carved into the form of a shield, and elaborately painted, were small streamers. Here also was set, or in some way delineated, a representation of the deity to whose tutelary favour the ship was committed. To this deity daily prayer and sacrifice were offered, and this was the naval sanctuary. Taking this into consideration, and that ancient vessels were universally named after some beast, bird, or fish, we shall easily resolve many stories of antiquity, which contain facts under absurd and unnatural guises.

Ships were very usually termed *horses* among the ancients, which sets off in a clearer light the story of Neptune and Minerva contending for the honourable guardianship of the city of Athens. The horse, which the former gave, was a symbol of maritime affairs; as the olive, given by the latter, was of agricultural peace and quiet. Though the victory was at the time adjudged to Minerva, we read of her being an early patroness of Navigation. We are told that the poorer people of Gades, (now Cadiz,) a Phœnician colony in the south of Spain, called their small barks *horses;* and we know that the Nubian savages, at the present time, call a *sailing-boat* "a *water-mare*." About 1500 years B.C., the Princess Europa, we are told, was carried off from Phœnicia to Crete, by Jupiter, who had assumed the form of a bull: the credible version of which story is, that Asterius, King of Crete, whose wife she afterwards became, went to her father's court, prevailed upon her to elope with him, and conveyed her across the sea in a vessel having the sign of the bull at its head, and the shrine of Jupiter at its stern. The chariot with winged dragons, in which Medea fled from the vengeance of her husband, was only a ship with sails. The Elder Pliny tells us of a boy, who was carried by water some miles on the back of a dolphin to school; the vessel, in all probability, having a dolphin at the prow. Arion, the famous musician of Lesbos, having made great wealth in foreign parts by his profession, was returning home by ship, when the sailors resolved to kill him and seize upon his riches. Playing once again, at his last request, a favourite tune, he leaped into the sea. A dolphin, attracted by the melody, received him safely on its back, and carried him again to the court of the prince, whence he had set out. Arion, doubtless, escaped by a boat, the fore part of which consisted of a dolphin. The flight of Phryxus with his sister Helle, into Asia, on the back of a ram having a golden fleece, and her falling through giddiness into that part of the sea afterwards named the *Hellespont*, or *Sea of Helle*, now the straits of the Dardanelles, is explained by considering that Phryxus absconded with an immense treasure in the ship Aries or Ram, and that his sister Helle, who accompanied him, fell overboard by some accident or other. The ship in which St. Paul sailed away from the island of Malta, had the twin sons of Leda for its sign. The Gemini were the patrons of mariners, and were deemed to be present with mortals, when a sacred light played around the tops of the masts. This light is now known by the people of the Mediterranean coasts, as St. Elmo's fire, and is due to electricity, which is attracted by points. Many of the signs of the Zodiac, and other constellations, received their names from the ships of early days, which the unaffected admiration of the times resolved to honour with immortal remembrance, by a belief in their translation to the skies.

The people of Ægina, an island in the Ægean, and of Crete, an island of the Levant, are among the earliest people, who pursued navigation. The inhabitants of Corinth and Corcyra were the first to form a fleet; but the Cretans are said to have been the first to possess the empire of the sea.



ANCIENT SHIP, SHOWING THE SIGN, OR IMAGE, AT THE PROW

WAR AND MERCHANT SHIPS.

THUS far respecting naval affairs in general. We must now observe that the vessels of the ancients were distinguished into two chief classes; each possessing its own characteristic features; *war ships*, and *ships of burden*. The former generally had no sails, but were impelled by oars, and were of great length; so that *long ships* was a term equivalent with *ships of war*. The latter were of a rounder shape, and were mainly propelled by sails.

The people most distinguished for naval warfare before the Christian era, were the Phœnicians, Carthaginians, Greeks, and Romans. One illustration of their war-ship and mode of fighting applies to all; as each one seems to have been tutored by its predecessor in political existence.

War-ships were chiefly rowed with oars, that they might be able to tack about, and approach the enemy at pleasure. The number and appointment of oars became more nume-

rous, as navigation improved. There were, according to the size of the vessel, rows, tiers, or banks of oars; not placed on the same level, but having the seats fixed at the back of each other in the manner of stairs. The most usual number of these rows was three, or four, or five. There were, however, many vessels, which had more tiers; and the ship's class was determined by this property. The first long ships were rowed, we are told, with fifty oars, in the thirteenth century B.C., and the notion of them was derived from Egypt. The size of this species of vessel, as depending upon the extent of the rowing-banks, became, we read, after many ages, enormous.

In the reign of Ptolemy Philopater, King of Egypt, about 200 years B.C., a ship of forty tiers of oars was constructed, each tier containing one hundred rowers. This ship carried, moreover, its complement of sailors and soldiers, and was called the Isis. A still more wonderful vessel was constructed about the same time by Archimedes, at the command of Hiero, King of Sicily. This ship had in it banqueting-rooms, galleries, stables, baths, and fish-ponds; it had also a temple of Venus, the floors and sides of which were painted with scenes from the Iliad of Homer. There seems to have been a rage at this time for constructing these huge machines, which the deficient nautical skill of the times could not apply to any useful purpose. They resembled floating islands, and, indeed, we are told that these, and such like fabrics, were too unwieldy for use, and served merely for show and ostentation. In a word, if there be no exaggeration, which is much suspected, and we be under no misapprehension, which is much feared, respecting these accounts, they serve, at least, to show that human nature often impotently attempts to outdo itself. The most usual size for vessels, in the more perfect condition of ancient navigation, allowed five tiers of oars, holding three hundred rowers, above whom were two hundred fighting men. The oars of those who were at the lower part of the vessel, and, consequently, nearer the water, were shorter than those of the rowers above, whose oars increased in length proportionally as they ascended. We are not well informed of the manner of applying the oars from so many tiers as we have here mentioned, or even more; and how the mechanical force, necessary for working the upper and longest oars, was effectively brought into play, but such we see on several coins and other fragments of antiquity. Two large holes at the prow of a vessel, occasionally used for oars, were called the *ship's eyes*. It has been noticed by voyagers, that in the fishing-boats of the Society Islands, these eyes are made of shells. To *bear up into the wind*, Acts xxvii. 15, means, when literally translated, *to present its eyes to the wind*,—in modern nautical language, *to loof up against the wind*.

Ships of war had at the prow a wooden projection, covered with brass, termed a *beak;* the use of which was to dash violently against an enemy's vessel, and sink or shatter it. Pieces of wood, placed on each side of the prow of a vessel, to ward off or counteract the force of the enemy's beak, were termed the *ship's ears*. The Romans, having defeated the Carthaginians in several naval encounters, carried home as prizes the beaks of the enemy's ships which they had captured. These they hung up in the Forum, about the tribunal from whence the public orators harangued the citizens. This pulpit was, therefore, called the *rostrum*, which is the Latin for *beak*. Hence, a person about to speak publicly, is said *to mount the rostrum*.

Over these vessels were certain raised platforms; at their sides were projecting stages, and on their forecastles were towers, on which the soldiers stood and levelled their missive weapons with greater force and certainty against the enemy: whereas the rowers, by their position in the hull of the vessel, were always secure from damage. Sometimes an attempt was made to sink the enemy by discharging a heavy weight of stone or lead into his ship. In the case of a siege on the sea-side, ships were connected together, along the circuit of water surrounding the walls; on which ships high towers were erected at intervals, to enable the besiegers to annoy the townsmen, and perchance to scale the walls, (see p. 40.) The besieged would, by means of a long lever, invented by Archimedes, lift the invading ships up out of the water; and suddenly letting them go, dash them to pieces. Towers made so as to be quickly raised, or let down, were used also in general naval engagements. Many ships had coverings of hides or skins, to protect all who were in the vessel from the darts of the enemy. The shields of the soldiers were usually hung upon the railing (see p. 40) which begirt the ship, and above which the stages appeared.

In the event of an engagement, everything was put out of the vessel which would not be wanted in battle. If the ship had sails, they were furled and put away; and it is to be observed that the ancients always avoided fighting in stormy weather. The order of battle was generally that of a half-moon, the best men and ships being stationed at the horns, or wings, for the purpose of breaking the enemy's line by beaking. Sometimes the semi-circle was directed *convexly* towards the enemy; at other times *concavely*. Upon some occasions the fleet was drawn up in a circle, as with the Peloponnesians; at others, in the form of the letter V, for the purpose of penetrating the body of the adverse squadron.

Prayer and sacrifice preceded the battle, accompanied with the exhortations of the admiral. The signal for engaging was given by sound of trumpet, which was repeated round the fleet, as also by hanging out a gilded shield, or banner, from the admiral's galley; which vessel was moreover distinguished by a red flag. The battle continued as long as the shield, or banner, was elevated. A paean, or war-song, to Mars was chaunted by the party which made the attack; and a hymn to Apollo was sung by the victors.

The admiral's galley would begin the engagement by endeavouring by a sudden, close, and parallel movement, to break, or sweep off, the whole set of oars on one side of a hostile vessel, which would thereby be disabled from performing any further manœuvres; or they might seek to disorder the enemy's line by attacks with the beaked prow, while the soldiers assailed their rivals with slings and darts, and eventually with swords and spears. In fact, the latter part of the battle would more nearly resemble a land-fight; for, when the ships came to close quarters, one party or the other would throw out iron grapnels, by which the vessels were locked together, and the weaker prevented from escape. This plan was usually resorted to by the party which was the inferior of the two in naval tactics. We find boarding-pikes mentioned by Homer as being used in naval encounters.

To enter more into detail of this sort would lead us insensibly from our subject. We may remark, however, that if the country which a fleet was sailing to, was hostile, or if there was no good harbour, they would draw their ships on land and form a naval camp.

The naval business of Athens had very great reference to war; but as conquest and the extension of dominion was the sole object proposed by the Romans in their assumption of naval tactics, all the proper business of navigation, from the master to the rower, was allowed to lie in the hands of slaves, or of the lowest classes. Hence the Romans make no figure in maritime history.

EARS AND EYES OF THE SHIP.

We have now to make a few remarks on the trading-vessels of the ancients; premising that, in natural order, this should have come first: as marine vessels originated in the necessity for transport, either of person or goods. Piracy, or robbery by sea, deemed to be an honourable employment in the infancy of a nation, was excited and encouraged by the convenience thus afforded; and then followed naval war.

The oval form of the merchant ship is, of course, to be referred to the accommodation of passengers, and the stowing away of baggage. It seems to have been flat-floored, broad, and of small draught of water, not very dissimilar to the Chinese junk seen in our day, which is thought by the best reasoning to be only a counterpart of the ancient ship of commerce. The length of the trading vessel was four times its breadth, while the war galley was eight times longer than broad. As the war ship, which had a mast, was distinguished by a helmet thereupon, and a banner at its bow, so a basket, emblematic of its nature, was suspended from the mast of the trading vessel.

The common burden of their best and largest trading-vessels seems to have been fifty or sixty tons, though much larger ones are alluded to; to the accounts of which there is attached the same uncertainty as we previously spoke of in the case of the rowing-galleys. An obelisk of fifteen hundred tons' weight was brought from Egypt to Rome, and placed in the Circus by Constantius, where it now stands. The same vessel carried, we are told, more than eleven hundred tons of pulse, placed at one end of the ship to balance the stone at the other. Such vessels as these, called Ætnas, or moving mountains, were not valued for ordinary use, being too cumbrous and unmanageable. Merchant-vessels having to pass from one country to another, were chiefly governed by sails, as mere transports were towed along the banks of rivers by cords.

We are not well informed what convenience the ancient mariners had for sleeping in their ships. Berths, for the convenience of passengers on board the foreign trading-ships, seem to have been made at the sides of the vessel, as with us; see Jonah i. 5: but we infer that the resting-places of the sailors themselves were of a chance-like nature, and no wonder that it should be so, as ancient navigation did not permit vessels to be long out at sea, or far from land. Ulysses, we read in Homer, slept on skins at the stern, and the rowers who, in the course of time, were selected from slaves or malefactors, reposed upon the benches where they had toiled. Any superior accommodation seemed likely to deteriorate the hardihood of the sailor; and Alcibiades the Athenian commander, Plutarch tells us, was censured for having on board a bed hung upon cords!

AN ANCIENT VOYAGE.

Having hitherto confined ourselves, in great measure, to the vessel and its detail, we pass on to the consideration of the ship, or fleet of ships, when making way over the waters; so that the observations which we shall here make will not relate to any particular order of shipping, unless so far as shall be specified at the time

The invariable time for sailing was that of Summer, when the heavens were genial, and the light of day exceeded the darkness of night; the means and experience of the ancient mariners did not permit it to be otherwise. Even with a smooth sea and fair wind, they could not for ages venture out of sight of the land, lest, in the apparently interminable waste of waters, they might be drifted about for ever: their voyages, therefore, to which they were tempted by trade and commerce, were a continual coasting; and vessels were, in certain circumstances, even towed along: being also often necessitated to land for provisions, they would not be long at a time out at sea, a thing which even the superstition of the sailors would have forbidden. Superstitious fears seem to have haunted sailors from the earliest to the present time; but these are, we trust, fast fading before the cheering light of the Divine Word.

It was an article of belief among the ancients, that a soul which had departed from a body unhonoured with the rites of sepulture, was condemned to wander in sorrow for a hundred years on the banks of the infernal river Styx, ere it could be admitted to a resting-place of bliss; being, therefore, in their landskirt voyages, at the mercy of the people of the coast, and impatient at the close confinement and restriction of the ship, having also their religious dread of the unfathomable and heaving deep, we need not be surprised that ages upon ages should pass away, and the shores of the Mediterranean, the first civilized portion of the West, be still the limits within which the naval art was practised.

When a voyage was contemplated, the ships, which had in all probability been hauled up on dry land, were pushed into the sea by the shoulders of the mariners, or by levers; or latterly, by means of a rolling-machine called a *helix*, invented by Archimedes, about 900 years B.C.

A fleet, or number of ships, being, therefore, about to set sail, every proceeding connected therewith became matter of religious parade and solemnity. Sacrifices having been performed, and each ship committed to the care of some deity, omens and prognostics were observed, and the trivial nature of some of them is such as to create a smile. The perching of a swallow on the mast, or the sneezing of any person to the left, would so perturb the minds of these enterprising sailors, as to delay the departure till the following day. When, however, nothing had occurred to mar the resolution of the voyagers, the ships were unmoored, and departed with oars or sails, or, perhaps, both, decked with flowers and garlands, and attended with prayers to Neptune and the other gods, from the voyagers and their friends remaining at home. When they had got a little out to sea, doves were let loose from the ships, which flying back to land, were hailed as omens of the safe return of the crew. The ship of the commander usually sailed on foremost, conspicuous for its gaudy ornaments: the others followed in order, and, when fairly out at sea, sailed three or more abreast, or alongside of each other, unless the weather grew rough and the sea unsteady; in which case they would keep off from one another, in order that the manœuvres of each vessel might not be hindered. Excepting under very favourable circumstances, they did not continue sailing through the night, but anchored in some cove or sheltered spot; or they drew up their ships on the beach, that all in the vessel might repose until the returning dawn. If they actually got out of sight of land, it was with the view of directing their course towards some headland, which they knew to lie in a certain direction.

In the progress of ages, as the knowledge of astronomy advanced, and various observations of the heavenly bodies were made and collected, the situations and bearings of places were, by these means, naturally attempted to be surmised. To navigate safely, and to trust oneself with confidence upon the pathless ocean, it is necessary to have always ready at hand, a safe and uninterrupted guide to the relative situations of places. Though it appears that the general principles of the loadstone were well known many ages before the Christian era, yet the polarity of a suspended needle was never dreamed of among the active nations on the western side of the ancient hemisphere, until within the last five hundred years. The early missionaries to China found that the compass had long been in use in that country*; but that curious people seem to have been the first to attain, in ancient times, a certain point of civilization, beyond which they have never since advanced. So that the ancient sailor, who had the greatest skill and means which his art afforded, could look only to the heavens for assistance; and they, oftentimes, in the midst of his greatest difficulties, were obscured. To navigate in such circumstances would be similar to walking with the eyes shut; it was natural for him, therefore, to cling to the coast, and scarcely venture off from the earth by night. But, after awhile, in addition to the motions of the sun and moon, it had been observed that certain stars towards the north never sunk below the horizon, but seemed to move continually round a definite point. The ancient Greeks noticed the constant revolution of the seven conspicuous stars, forming the hinder part of the Great Bear; but it appears that the commercial Phœnicians had already more closely tracked up the northern point of the sky by directing their attention to a set of stars, which kept on revolving in smaller circles than those observed by the Greeks. This was the constellation called the Little Bear; at the tip of the tail of which animal is situated a star, now called the Pole Star. This is the nearest plainly visible star to that point which is in a line with the pole of the earth, infinitely extended northward. When the use of these observations had been made familiar by practice, the nautical art advanced considerably, and various schemes of enterprise were formed, and effected with more or less success.

It has been well observed that it is a distinctive feature

* See *Saturday Magazine*, Vol. III., p. 116.

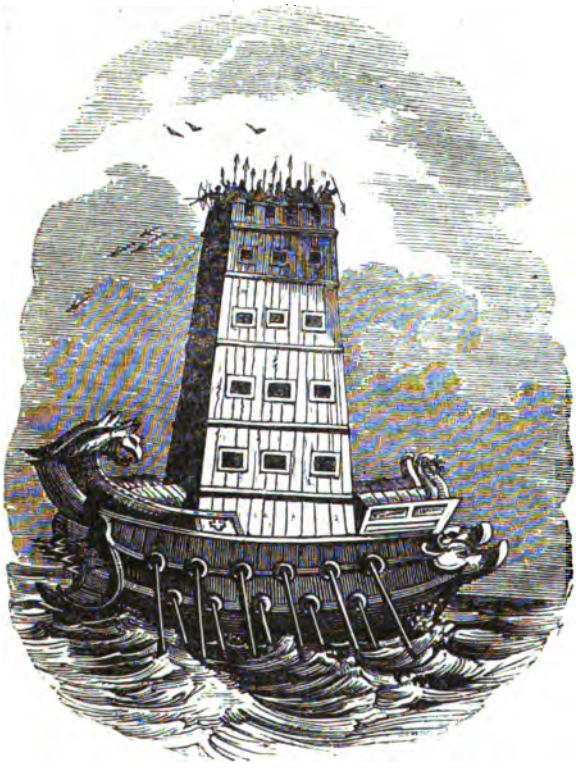
in modern Navigation, as compared with that of the ancients that the method of conducting a ship now from place to place, as depending upon definite and distinct rules, is much more safe and simple, and requires, perhaps, less training and study, while it effects much more than the method of the ancients. The naval officers particularly offering themselves to our notice by their official variation from the moderns, are the master of the rowers, and the pilot. It was the business of the former to attend to the rowing department of the vessel, to assign their places to the rowers, to encourage them in their labours, and to keep time to the motion of the oars, by the strokes of his mallet, or the musical intonations of his voice. The other officer, who especially claims our attention, is the pilot, or master of the ship; to whom belonged the duty of navigating the vessel, and who was consequently responsible for the safety of the ship, and all on board. His place was at the stern; and to excel in his vocation, he had to possess an exact knowledge of his art, which consisted chiefly in skill in steering, in managing the sails, and in the use of other nautical appurtenances, together with a knowledge and experience of the winds, of the heavenly bodies, as indicating the seasons, portending the weather, and directing the course of the ship, and of the site of commodious ports and harbours; when rocks and quicksands were to be dreaded, and how they might be avoided. The ancients retired into harbour when they saw the Winter signs begin to rise; where they remained till the constellations of Spring invited them upon the waters. It was not usual, therefore, for them to prosecute their voyages long after the Autumnal Equinox. The gales which then prevailed in the Mediterranean, formerly called Euroclydons *, or Tuffoones †, but now *Levanters*, or *Michaelmas flows*, being hazardous to shipping, made them lie by for the Winter. The necessity of this is alluded to in Acts xxvii. 9. The Jewish fast of expiation, which is there meant, was on the 25th of September. It was also necessary for the pilot to understand and explain the signs and prognostics which offered themselves from the sea-birds, the fishes, the surge, the billows dashing upon the shore, and the waving of the woods on the impending heights. A seaman, unapt in the solution of any novelty of this sort, could not attain to the reputation of a good pilot.

It was also expected that this personage should have procured an ample supply of favourable winds; as the Lapland captain of our times buys of the wise women a quantity of this necessary material for navigation. We are told that Ulysses, having procured a bag of wind, was returning home to Ithaca with a prosperous sail. When his native isle was just in sight, and the hero had fallen asleep through fatigue, the bag was opened by the sailors, who suspected that treasure was concealed in it: whereupon the winds rushed forth with awful violence, and drove the ship backward a distance of ten days' sail.

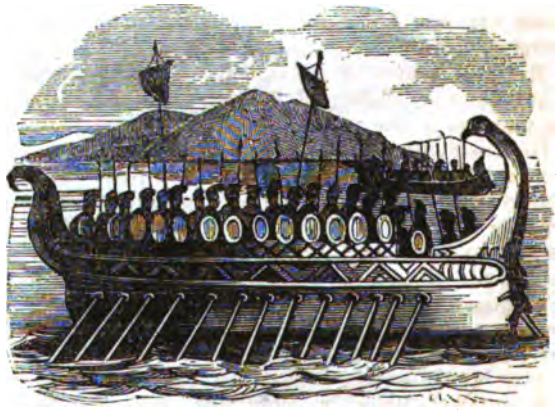
At the termination of a voyage, the vessels were usually stranded by urging them stern foremost towards the land, when the crews drew them up out of the water by main force.

The notion of light-houses seems to have been generally adopted about the time of the Christian era from the Egyptians. The small island of Pharos, in the bay of Alexandria, had been joined to the continent by a causeway of a mile in length, about 284 B. C. At the extremity of this mole was built a white marble tower, at the top of which a fire was kept constantly burning, visible, we are told, at the distance of one hundred miles; but this would make it to have been somewhat more than a mile in height from the surface of the earth, unless, indeed, it were visible from some eminence a hundred miles distant. This part of the account seems apocryphal, and even the site of the celebrated Pharos is a matter of dispute. The pride of man has doubtlessly exaggerated the facts of many ancient narratives; and from this, perhaps, as well as from many other classical stories, we must make considerable deduction but, at any rate, we have accounts of various erections of this nature, and they seem at the later period of ancient navigation to have been not uncommon, when ample experience had made nocturnal sailing less formidable. We find them accordingly erected at most of the harbours and naval stations which ships frequented; places where nature had been assisted by art, and where the larger-sized ships rode at anchor, secure from the swell of the seas around.

The ancients generally, as well as the barbarians of modern times, carried their idols with them on a voyage, thinking thereby to ensure the safety of the ship. Vows, therefore, which had been made previously to, or during the voyage, were now discharged, and especially was due reverence paid to Neptune, whose peculiar dominion they had just safely left. Those who had landed in safety after a storm, or any other of the manifold hazards of a sea-voyage, hung up in one of the numerous temples surrounding the port, a picture of their disaster, together with the garments in which they had escaped it. This, with a multitude of other Pagan customs, has been exploded by time in most of the countries of the world; but we learn that this act of piety is still practised on the coasts of the Mediterranean, where the people profess the Roman Catholic faith. Happy would it have been for the human race, if no heathen custom more questionable than this, had received the sanction of the teachers of Christianity in the ages succeeding the times of the Apostles!



ANCIENT FLOATING TOWER.



ANCIENT ROMAN WAR GALLEY.

* A billow-excitin east wind. † A whirlwind.

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THE STORY OF

MASANIELLO, THE FISHERMAN, AND THE REVOLUTION OF NAPLES.

THE LAZZARONI OF NAPLES.

PART THE FIRST.

THERE are few kingdoms in Europe which have undergone so many vicissitudes as that of Naples; and the chief source of its calamitous changes was the preposterous claims of the popes to dispose at their pleasure of the crown. After the overthrow of the Hohenstauffen, a dynasty remarkable for its uncompromising hostility to the papal usurpations, the sovereignty of Naples was bestowed upon the house of Anjou; but this French race of princes soon became unpopular, and after many changes and convulsions, the Neapolitan dominions were annexed to the kingdom of Spain, then rapidly rising into the foremost rank of European states. It remained quietly subject to Spain for nearly 150 years, until in the year 1647, a poor fisherman raised a revolt, which entailed upon it additional misery. The history of this extraordinary revolution is so very interesting, and so very instructive, that we shall relate it at full length, especially as some of the most important details have been hitherto hidden from English readers. To understand the causes of the revolution, it will be necessary to give a preliminary sketch of the Spanish tyranny over the Neapolitans.

When Spain first acquired dominion over Naples, the latter country, notwithstanding recent wars, was wealthy and populous; and its position afforded a reasonable prospect of increasing prosperity, for it possessed the finest ports in the Western Mediterranean, then the great high-road of commerce. Spain, on the other hand, was exhausted by long wars against the Moors, the recent discovery of America had seduced a large portion of the population to emigrate to the new countries, and the gold and silver imported from Mexico and Peru did not compensate for the abstraction of cultivation from the land, the emigration of the most industrious, and the consequent cessation of domestic improvement. Under these circumstances the Spanish government regarded its Neapolitan territory as a kind of reserved treasury by which all the pecuniary deficiences of Spain might be supplied and the chief object of their administration was to drain as much money from their Italian subjects, as they could obtain by fair means or by foul. Naples, of course, was governed by viceroys; the only object contemplated in the selection of these officers was their skill in extortion, and if they sent home money in plenty, no objection was made to any

acts of tyranny or rapacity in which they might please to indulge on their own account. The fertility and opulence of the Neapolitan dominions would have enabled them to bear very heavy exactions, but the more the Spaniards obtained, the more they desired, and the very ease with which existing taxes were paid, became an excuse and encouragement for fresh impositions. Thus matters proceeded, until, as an Italian historian justly remarked. "The secret fires of Vesuvius were not so numerous, nor so dangerous, as the revengeful flames which burned in the bosoms of the Neapolitan populace."

During the reigns of Philip the Third and Philip the Fourth of Spain, the sufferings of the Neapolitans were aggravated by the custom which prevailed of farming the taxes. The Genoese brokers, who purchased them from the King of Spain, extorted profit in every shape and way, from the unfortunate peasant and artisan, and when profits no longer supplied their rapacity, compelled the unfortunate victims of their rapacity to yield up their little capital. Under such a system it is not wonderful that the wealth of Naples at length became exhausted; and when the Admiral of Castile, the ruling viceroy, demanded a subsidy from the assembled estates, he received a refusal which he was convinced arose from absolute poverty. He wrote to Philip the Fourth, that Naples in its present exhausted state, could not meet the new demand; he received in reply, peremptory orders to exact the subsidy, but the gallant admiral refused to become the agent of oppression, and immediately resigned the government.

This excellent nobleman was succeeded by the Duke of Arcos, a man of a very opposite character. Like most Spaniards, he was haughty, vindictive, and obstinate, but unlike his countrymen, he was crafty and treacherous. He had not been long in office, when the French, then at war with Spain, sent out a fleet which threatened to invade Naples, and consequently forced the viceroy to prepare an armament for the protection of his province. The practice of that day in such an emergency, was to borrow the amount of the parliamentary grant from some capitalist, to whom a branch of the public revenue was mortgaged for the interest and repayment of the loan, and who generally derived an exorbitant profit from the transaction. Such was the general opinion of the Neapolitan resources, that a lender and money were easily found, but such, also, was the exhaustion of the country, that the viceroy's council were at their wits' end to devise an impost for its repayment. At length it was proposed by Andrea Nauclerio, the provost of the merchants, to levy a tax of one carlin per pound, on all the fruits and vegetables which were brought to market, and which then, as now, formed the principal articles of food to the lower classes at Naples. The proposition was adopted, and an edict for its enforcement issued on the 3rd of January, 1647.

This tax was by no means a new invention; several viceroys had already attempted to establish it, but had finally abandoned the scheme, from a conviction of its odious and oppressive nature. The Duke of Arcos, however, was deaf to all remonstrances, and he even accused those counsellors of treason, who ventured to remind him of the homely proverb, that "Hunger will break through stone walls." Scarcely was the edict published, when loud murmurs were heard throughout the entire city of Naples. It is a city in which a large vagrant body, called the Lazzaroni, accustomed to support life at a very trifling expense, support themselves by chance jobs, because a trifling remuneration, less than Englishmen frequently bestow in alms, enables them to live in the luxury of indolence. On this numerous and dangerous class the tax pressed with enormous severity; to use their own expression, recorded by a contemporary writer, "it took the food out of their very mouths." Acts of violence succeeded to their disregarded murmurs; the viceroy could not appear abroad without being subjected to seditious clamours, and even personal insults; insurrectionary placards were posted in the market-place; and the booth erected for the collection of the tax was burned to the ground. Arcos at length, greatly alarmed, summoned his council, and went through the mockery of deliberation; but every other source of revenue was pledged and mortgaged to the outside of its value, money was to be raised at all hazards, and, of course, the consultations ended in ordering the continuance of the tax. Some efforts were made to punish those who publicly testified their dissatisfaction; but this only increased the number of secret conspirators, and the viceroy soon received an alarming warning of the perils by which he was environed. A Spanish flotilla lay in the Bay of Naples, the admiral's galley was remarkable for its strength and beauty, and 300,000 ducats were placed on board her for transmission to Spain. On the night of the 12th of May, she was discovered to be on fire, and ere means could be taken to save her, she blew up with all her treasure, and a portion of her crew. There was not one who saw the spectacle that did not feel convinced that it was the work of treachery, and the viceroy felt so much alarmed, that though he was pre-eminently superstitious, he forbade the annual procession on the 24th of June, in honour of John the Baptist, lest the collection of a multitude should lead to a sudden outbreak of insurrection.

Among those who exclaimed most bitterly against the fruit tax, was Tomasso Aniello, better known by the abbreviation Mas-aniello, whose destiny it was to experience more rapid changes of condition in the ensuing troubles, than any mortal ever underwent in the same space of time. He was a handsome, light-built, active, young man, not more than twenty-four years of age, but already recognised as a leader among his associates, from his readiness of wit, and great personal activity in the manly sports which delight the fishermen of Naples. His wife was detected by the tax collectors concealing a bag of flour, to evade the duty; she was grossly insulted and dragged to prison. The rest of the history must now assume the form of a journal, that our readers may the better appreciate the rapidity with which events followed each other.

July 7, 1647. This was the second Sunday before the feast of our lady of Carmel, one of the festivals celebrated by the superstitious Neapolitans with circumstances of peculiar solemnity. Among other amusements, it was customary to erect a wooden fortress, which the fishermen defended disguised as Turks, while the Lazzaroni attacked it in their ordinary habiliments. So popular was this spectacle, that it was always rehearsed on the three preceding Sundays; on the Sunday of which we speak, Masaniello, who had been chosen leader of one of the parties, assembled a crowd of boys and young persons, at a very early hour, to practise their parts in the performance. It so happened that this was also a great market-day, and crowds of peasants from the neighbouring districts had come in with fruit and vegetables for sale. Either on account of the superabundant supply, or the engagement of the multitude in their sports, the market was very heavy, and purchasers could not be found for the articles. The fiscal officers insisted that the tax should be paid on

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everything, whether it was sold or not; but it still remained to be decided whether the tax should be paid by the peasants or by the hucksters. The dispute was referred to Nauclerio, the provost of the merchants, whom we have already mentioned as the proposer of the obnoxious impost, and he decided that the tax should be paid by those who brought the fruit to market. Masaniello's brother-in-law, a hard-working peasant from Pozzeroli, was one of the persons aggrieved by this decision; he exclaimed against the injustice of being compelled to pay for articles which had as yet produced him no profit, and his loud tones soon attracted the notice of Masaniello and his companions. They hurried into the market-place, and the peasant, now sure of support, ventured to give free scope to his indignation, by throwing about the figs, which had been the original cause of the dispute, crying out, "Take these who will, our tyrants shall have none of them!" In an instant, Masaniello, who stood by his side, seized a bunch of figs, and flinging it violently into Nauclerio's face, exclaimed, "Let them take this at the least!" This was the signal for a general riot, missiles of every description were flung at the tax-gatherers and their attendants, one act of violence led to another, the toll-bars were torn down, the booths of the collectors burned, and in a very few minutes the market-place was at the mercy of an infuriate populace. Masaniello seized the opportunity of addressing his companions, indignation prompted his eloquence, and though he had no advantages of education, his harangue was one well calculated to ensure the support of the mob. He pointed out to his hearers the dangers they had already incurred by provoking the vengeance of the Spaniards, he declared that this was the crisis of their country's fate, he conjured them to stand by him, and promised in the strongest terms a redress of all the grievances of which they had to complain.

Such, indeed, are the topics always used by a demagogue to inflame a multitude; but Masaniello was not an orator who traded on excitement, it was a mere accident which elevated him to be the author and leader of a movement. But his career fully proved the perils that arise from stimulating the passions of the ignorant, and added one to the many proofs which history affords of the impossibility of correcting evils by an appeal to physical force, without producing calamities infinitely greater than the oppressions which led to the insurrection.

Goaded onwards by the fiery harangue of Masaniello, the mob rushed from the market-place; some armed themselves with their ordinary implements of industry, others broke open the shops of the gunsmiths and seized the weapons they contained; the houses of the farmers of taxes were broken open, shots were fired into the houses of persons supposed to be favourable to the Spaniards, and many took the opportunity of revenging private quarrels under pretence of zeal for the public cause. At first the insurgents abstained from plunder, but in this as in countless other instances, the vehemence of patriotism was soon unable to restrain the lust of pillage; the women who had joined the rioters, gave the example of pilfering, which soon extended into a regular system of robbery.

As yet the insurgents had no acknowledged leader; like all vulgar rioters they wished to have a member of the aristocracy, and accidentally meeting the Prince of Bisignano, they compelled him to act as their chief. But though the Neapolitan nobles were justly indignant at the tyranny of the Spanish viceroy, they were too wise to countenance the outbreak of the populace; they knew full well that a mob, after having used the nobles, whom deluded ambition has led to participate in their efforts, must eventually yield to the natural jealousy with which the lower orders regard their superiors and fling them away as broken tools, too fine and too weak to execute the rough work required by an imperious democracy. Shocked at the excesses he was compelled to witness, the Prince took the earliest opportunity of escape, while the confused masses spread over the city, began to direct their forces on one common centre and move towards the viceroy's palace.

The viceregal guards made a faint effort to resist the popular current, but they were soon overcome, and a body of the rioters forcing their way into the viceroy's presence, imperiously demanded not only the abolition of the obnoxious impost on fruit, but of all other taxes and impositions whatever. Terrified by violence, destitute of any force on which he could rely, and perceiving that the popular excitement increased every hour, the Duke of Arcos readily assented to every demand; but his compliance did not allay the tumult, the mob began to destroy his most valuable furniture, and did not abstain from personal violence. He attempted to escape in a coach, but was detected, abused, threatened and struck; by flinging money among the mob, he diverted their attention for a moment, and while they were eagerly engaged in a scramble, he succeeded in making his escape.

After his departure, the mob proclaimed Masaniello "Captain General of the faithful people of Naples," he who had been an humble fisherman in the morning, was an absolute sovereign ere the night closed in. He nominated a council composed of the lowest and most infamous of the rioters, but, in the true spirit of a low democrat, flushed by temporary power, he did not permit his fellow rebels to deliberate on his orders; indeed he would scarcely deign to listen to their advice

Even at this early stage of the revolution, symptoms were perceptible of the insanity to which Masaniello ultimately fell a victim, and which was necessarily ripened by the excitement of the strange circumstances in which he found himself placed. He made the tower of the Carmelites his head-quarters, and there, while his council talked rather than deliberated, he stood in moody silence, warming his hands over a chafing-dish of coals. The only answer he made to repeated inquiries was, "I feel a burning and a heaviness as if my brain were overflowed by molten lead; but the Blessed Virgin and the Holy Saints appear to me every night, and promise me their assistance and protection. I have promised freedom to the people and they shall be free, yes I promise it, I swear it, they shall be free." This and similar broken speeches were uttered with maniac vehemence, which made them pass with his deluded votaries for words of inspiration. They unhesitatingly obeyed his orders to break open all the prisons, and liberate the captives; they massacred the few inhabitants who ventured to resist, and they set fire to the mansions of several obnoxious individuals. One of the houses which became the prey of the incendiaries, contained a large quantity of gun-powder, it was blown up, and eighty seven persons lost their lives. Sunday night was spent sleeplessly by the population of Naples; the flames of burning houses lighted every quarter of the city; the shrieks of the wounded and the lamentations of the relatives of the slain were heard in every street, save where the imperious insurgents forcibly compelled silence.

HISTORY OF THE OLIVE TREE, AND THE MODE OF PREPARING THE OIL.

No. I

THE Olive-tree (*Olea Europæa,*) came originally from Asia, and grows abundantly about Aleppo and Lebanon. It is naturalized in many parts of Southern Europe, being found in woods and hedges, and in this wild state produces a small fruit of no value. When cultivated, however, it becomes one of the richest productions of the South.

It is an evergreen tree, with thick and leathery leaves, well calculated to resist the action of water, as they once did for the space of two hundred and seventy-one days; the period that elapsed from the day on which "the fountains of the great deep were broken up," until the evening when the dove came in to Noah, "and lo! in her mouth was an Olive-leaf pluckt off." And ever since, in all ages and countries, wherever this tree is known, has its branch been the favourite emblem of peace. The same chapter of Genesis also illustrates the locality of the Olive. The ark had rested on Mount Ararat one hundred and fourteen days, and the tops of the mountains had been seen forty days, yet when Noah sent forth the dove the first time, it returned, finding "no rest for the sole of her foot;" and it was not until seven more days had passed that the waters had retired from the plains, valleys, and rocky ravines where the dove is accustomed to seek its food, and in which the Olive delights to grow. The flowers are delicately small and white, are very numerous, and fall off in showers when the tree is shaken; so Eliphaz, upbraiding Job for his sins and misfortunes, and alluding to the loss of his children, says, "The wicked man shall shake off his unripe grape as the vine, and shall cast off his flower as the Olive." (Job xv. 33.) The oval fruit has a delicate light-blue bloom upon it, but when this is rubbed off, is of a deep purple colour, shines, and has lost its beauty.

To an English eye this tree has, at first sight, no striking characteristic of beauty. Its height, which rarely exceeds thirty feet, creates no idea of grandeur, which in countries like England, that abound with lofty forest trees, is considered one of, if not the chief, element of beauty in trees. Again, it has a most sober hue that ill agrees with our preconceived notions of the golden tints of southern foliage; hence those, who in the rapidity of travelling glance at it with a careless eye, are generally disappointed, and hence it is almost universally compared with our own willow. Southey speaks of its "willowy foliage," but the points of resemblance are not sufficiently well marked to justify the comparison of an Olive-grove with an ozier-holt. It is true that both trees are of about equal height, and have the under surface of their leaves of a lighter colour than the upper, which is very beautiful when their branches are turned or lifted by the wind. The cultivated Olive, too, is pollarded or deprived of some of its branches in order to develop the young wood; but as the fruit is the object and not merely the wood, as is the case with the willow, its branches are never destroyed year after year, and, consequently, it never has the unsightly appearance that that tree has when deprived of all its foliage. The poet Virgil *contrasts* the Olive with the willow. Making a shepherd praise one man at the expense of another, he says, "You are as much superior to him, as the dusky willow yields in beauty to the pale Olive." But it has charms superior, not only to the willow, but to most other trees. If the eye is not attracted towards it at first by any striking beauty, there are few natural objects that improve so much upon acquaintance. The more you see it, the more its graceful form and quiet beauty wins your admiration. It appears to greatest advantage in rocky situations, in the country round Athens for example, where an absence of general vegetation, during the warmer months, produces a beautiful contrast between the naked and burning rocks and the luxurious Olive-groves of the lower lands. A more beautiful scene can hardly be imagined than that from the Acropolis, a rocky fortress that rises abruptly on the south side of the city: standing within the portico of its Parthenon, you look down upon Mars' Hill, where St. Paul declared unto the superstitious Greeks the unknown God whom they ignorantly worshipped; beyond is the scarcely less famous pulpit of Themistocles, but it is to the plain to which the eye flies for relief, for—

> See there the Olive-grove of Academe
> Plato's retirement.

Previous to the late revolution, this grove extended from the walls of the city to the sea; but during the war, 20,000 trees were burnt, and many an old tree may now be seen reduced to charcoal on one side, yet retaining its vitality on the other. The annexed figure represents one that had actually been burnt into two separate trees, resting against each other for mutual support, yet loaded with fruit at the time the sketch was taken. Some of these were purposely destroyed by the enemy, and some were cut for firewood. The facility with which this tree takes fire, even when standing in the green state, was not unknown to the ancients, and is thus noticed by Virgil:—

> Sparkling fire from hind's unwary hands
> Is often scattered o'er their unctuous rinds,
> And after spread abroad by raging winds:
> For first the smould'ring flame the trunk receives,
> Ascending thence, it crackles in the leaves,
> At length victorious to the top aspires,
> Involving all the wood in smoky fires.
>
> DRYDEN'S *Virg. Georgics.* II.

Since the peace, many thousand trees have been destroyed by floods. Drainage has been neglected, and the water stood for months upon the roots, and eventually killed the trees. A burning sun acting upon this mass of decayed vegetable matter, generated one of the most dreadful fevers that ever visited Athens. It paralysed the whole population; for two seasons there was scarcely an indication of exertion to cultivate the soil. In the suburbs, where scraps of land are generally so precious, there were no gardens; a few fig-trees and a solitary palm, which the war had spared, were almost the only

remnants of former industry: but the Government, in 1835, had succeeded in draining the whole of the neighbouring country, and the Olive-grove of Athens was rapidly recovering from its losses by fire and water.

A volume might be written upon the *historical associations of the Olive*. It is frequently mentioned in the Bible both in its cultivated and wild state. The promised land abounded with Olives, it was "a land of Oil, olive, and honey." It was cultivated by kings as well as by their subjects. David set officers over his "Olive-trees in the low plains," "and over the cellars of oil." (1 Chron. xxvii. 28.) To be deprived of it, was one of the temporal punishments of the disobedient Israelites. "Thou shalt have Olive-trees throughout all thy coast, but thou shalt not anoint thyself with the oil: for thine Olive shall cast his fruit." (Deut. xxviii. 40.) And Samuel, speaking of the oppressions of a king, says, "He will take your Olive-yards, even the best of them, and give them to his servants." (1 Sam. viii. 14.)

We can trace the custom of using Olive-oil in religious ceremonies to the highest antiquity. Jacob poured it upon the pillar that he set up in Beth-el. (Gen. xxviii. 18.) The holy anointing oil of the temple was Olive-oil, scented with myrrh, cinnamon, sweet calamus and cassia.

The Mount of Olives is consecrated to us by the holiest associations. At the foot of the Mount, over the brook Cedron, is the Garden of Gethsemane, and according to Major Skinner, one of the latest travellers in the East, it abounds at the present day with exceedingly old Olive-trees. To this garden, "Jesus ofttimes resorted with his disciples." It was the scene of his prayer, of his agony, and betrayal. In one of her beautiful sonnets, Mrs. Hemans has adverted to the awful circumstances connected with this spot.

> The palm—the vine—the cedar—each hath power
> To bid fair oriental shapes glance by,
> And each quick glistening of the laurel bower
> Wafts Grecian images o'er fancy's eye:
> But thou, pale Olive! in *thy* branches lie
> Far deeper spells than prophet-grove of old
> Might e'er enshrine:—I could not hear thee sigh
> To the wind's faintest whisper, nor behold
> One shiver of thy leaves dim silvery green,
> Without high thoughts and solemn, of that scene
> When, in the Garden, the Redeemer prayed—
> When pale stars looked upon his fainting head,
> And angels ministering in silent dread
> Trembled, perchance, within thy trembling shade.

This tree was a great favourite with the ancient Greeks. They held it in such esteem, that the Athenians imagined that Minerva, the patron goddess of their city, created it peculiarly for them:—a superstition which arose from the crafty policy so eminently characteristic of their nation. In the time of Themistocles, some of the nobles, for the purpose of opposing his views, which were directed towards making them a maritime and warlike nation, and to induce the ignorant multitude to turn their attention more to agriculture, invented the fable of a contention between Minerva and Neptune for the honour of protecting the city of Athens. The assembly of the gods promised the preference to whichever of the two gave the most necessary and useful present to the inhabitants of the earth. Neptune, upon this, struck the ground with his trident, and immediately a horse issued from the earth. Minerva produced the Olive, and obtained the victory by the unanimous voice of the gods, who observed, that the Olive, which is the emblem of peace, is far preferable to the horse, which is the symbol of war and bloodshed. When in the island of Teaki, the ancient Ithaca, the writer saw an antique seal upon which, in allusion to the above fable, Minerva was represented standing in a very graceful attitude, resting her right hand upon her young Olive-tree. It was found in that island, and was in the possession of Signor Marco Zavò, an Ithacan merchant of noble family, whose house is ever open to English travellers, and as there is no hotel in the island, his hospitality is not infrequently taxed. The figure is an enlarged representation of an impression from the seal.

As sacred history made the Olive emblematic of peace, so, from its great value to man, has it been universally considered the symbol of plenty. As such we find it on the coins of those countries of which it is not a native; our own Britannia holds in her right hand the Olive-branch of peace and plenty.

Scarcely an ancient custom existed in Greece with which we do not find this tree, in some way, associated. The wild Olive was never used on these occasions, but there were plantations sacred to their religious rites and festivities; and it was sacrilege to use them for any other purpose. A law existed, "if any one plucks up the sacred Olive-trees at Athens, beside the two yearly allowed at the public festivals and funerals, he shall pay one hundred drachms (3*l.* 4*s.* 7*d.*,) for every one unlawfully pulled up, the tenth part of which fine shall be due to Minerva."

The victors at the Olympic games were crowned with wreaths of a peculiar variety of the Olive, which was brought by Hercules (so fable will have it,) from the Scythians, and planted near Olympia, where it flourished. It was called Callistephanos, that is, *fit for crowns*; and it was forbidden, under a great penalty, to cut it for any other use. Games, similar to these were revived at Athens in 1835, and Otho, the amiable young King of Greece, crowned the victors with wreaths of Olives.

In all festivals in which Minerva was concerned, we find the Olive used as believed to be most acceptable to her. At the lesser Panathenæa, an Athenian festival in honour of her, the conqueror at the games then held, was rewarded with a vessel of Olive-oil, which he was permitted to dispose of how and where he pleased, whereas it was unlawful for any other to transport that commodity: further, he received a crown of those Olives which grew in the Academy and were sacred to Minerva.

At their marriages every part of the bridegroom's house, and more particularly the door, was decorated with flowers and boughs upon the nuptial day. Plutarch says that the Olive was more particularly used for this purpose. The same custom is seen, at the present day, both in private and public rejoicings. When the king of Bavaria, the father of Otho the First, paid a visit to his son, there was scarcely a door-post in the streets of Athens through which he passed that was not covered with myrtle and Olive-boughs.

At the ancient funerals the body, after being washed was anointed with Olive-oil; cups of oil, together with incense, were thrown upon the burning pile, and the priests at the end of the ceremony

> .....dipped an Olive-branch in holy dew,
> Which thrice he sprinkled round; and thrice aloud
> Invoked the dead, and then dismissed the crowd.

It was a privilege of the citizens to use the oil in the schools of exercise, for one of the laws relating to these schools was, that "no slave shall presume to anoint." In the ancient baths there was a room for the purpose of anointing with oil, to close the pores of the body after the use of the hot baths, and to prevent the skin from becoming rough after the water was dried off. Pliny says that, at the time of the Trojan war, they had no better unguent than common olive oil perfumed with odoriferous herbs, especially roses. It was considered effeminate for the men to use even this, and, at a much later period, the Greek virgins were not allowed to anoint themselves with any odorous unguent, but used simple olive oil. Minerva and Diana are represented as rejecting perfumed oils. Solon made a law that "no man shall sell perfumes;" but Socrates was of opinion that it was decent enough for women to smell of perfumed unguents, but that men should rather smell of oil, an opinion which the modern Greeks seem very generally to have retained, and actual contact is unnecessary to detect their partiality for it.

The Olive-tree was scarcely less a favourite with the Romans, although it was not held in the same sacred light as amongst the Greeks; the ivy and the vine in some measure superseding its use. Their garden-god, however, was adorned with it; this god, usually cut out of the trunk of some old tree, was crowned with various wreaths peculiar to each season. In spring, it was decorated with flowers, with corn in summer, with the vine in autumn, and with the Olive in winter, the most appropriate season for it, as at any other period either the flowers or fruit would be destroyed. In a poem ascribed to Catullus, this rustic god is represented as saying—

> Soon as the vernal season smiles,
> I'm gaily crowned with flowery spoils;
> But yellow wreaths of ripened corn,
> 'Mid summer heat, my brows adorn;
> The luscious vine's thick branches spread
> In blushing autumn round my head;
> And, when cold blows the wintry winds,
> My temples pale-green Olive binds.

The Romans, ever superstitious, were in nothing more so than the uses to which they religiously applied certain woods, some of which they called "fortunate," others "unfortunate." When they burnt anything bad or ill-omened, they made use of such unfortunate trees that were under the protection of the infernal gods, as the holly and all kinds of thorny shrubs; on the other hand, the Olive, fig, pear, and apple trees, and the vine, and many other trees, that were valuable for their productions, they used on joyous and fortunate events. The wild Olive, as being unproductive and useless, was classed with the former, and the cultivated with the latter.

The oil was more used in their toilet than in that of the Greeks. Catullus, accusing some luxurious Latin youth of effeminacy, says, that his couch was "fragrant with chaplets of flowers and perfumed with the Syrian Olive oil." Any one would suppose that oil of a superior quality was, at that period, an article of commerce between Syria and Italy; but any rich odour was termed Syrian with the Romans, and in this case with great propriety, as the Olive came originally from that part of Asia.

EASY LESSONS ON CHRISTIAN EVIDENCES.

No. XIV.

MODERN JEWS. PART II.

It is likely that when Jerusalem and its Temple were destroyed, several of the Jews who had till then rejected the Gospel, may have been at length converted, by the strong additional evidence which was thus afforded. They saw the heavy judgment that fell on their nation; and that it was such as to make the observance of their law impossible. They saw, also, that the event agreed with what Jesus had predicted forty years before. And they saw, too, that those of his followers who had been living in Jerusalem, had been enabled to escape destruction by following his directions, and fleeing to the mountains as soon as they saw Jerusalem encompassed by an army. It is, therefore, likely that several may have been led by this additional evidence to embrace the Christian faith. But of this we have no records; as the book of Acts takes in only an earlier period. And in that book we have no particulars of the numbers of those Jews who were converted; though it appears they must have amounted to many thousands, indeed, many myriads; that is, tens of thousands; as is said in the original Greek of Acts xxi. 20. But still these made but a small portion only of that great nation. And as the Jewish Christians would soon become mingled with the Gentile Christians, and cease to be a separate people, hence, all those who are known as Jews at this day, are the descendants of those who rejected the Gospel.

They are computed to amount, at the present time, notwithstanding the prodigious slaughter of them, at the taking of their city, and on several other occasions, to no less a number than 4,800,000, scattered through various parts of the world; everywhere mixing and trading with other nations; but everywhere kept distinct from them by their peculiar faith and religious observances. And everywhere they preserve and read with the utmost reverence their sacred books which foretell the coming of the Messiah, or Christ, at a time which (by their own computations) is long since past, namely, about the time when Jesus did appear. Their books foretell, also, such judgments as their nation is suffering; and foretell, too, what is most remarkable, that notwithstanding all this they shall still remain a separate people, unmixed with the other nations.

You should observe, too, that these prophecies are such as no one would ever have made by guess. Nothing could have been more unlikely than the events which have befallen the Jewish nation. Nothing like them has ever been foretold of any other nation; or has ever happened to any other. There are, indeed, many cases recorded in history, of one nation conquering another, and either driving them out of the country, or keeping them in subjection. But in all these cases, the conquered people who have lost their country, either settle themselves in some other land, or if they are wholly dispersed, generally become gradually mixed and blended with other nations; as, for example, the Britons and Saxons, and Danes and Normans, have been mixed up into one people in England.

The only people who at all resemble the Jews in having been widely dispersed and yet remaining distinct, are the people commonly called Gipsies, and whose proper name is Zinganies, Jinganies. It has been made out that they are an East-Indian nation, speaking a Hindoo dialect. And they are widely scattered through the world, keeping up their language and some customs of their own, in all the countries

through which they wander. They are certainly a very remarkable people; and if there had been any prophecy (which there was not,) of their being thus dispersed, we might well have believed that such a prophecy must have come from inspiration.

But in some remarkable points their condition differs from that of the Jews, and is less unaccountable.

First, they do not (like the Jews) live in towns among other men, and in houses; but dwell in tents, by the road-sides, and on commons; leading the life of strolling tinkers, pedlars, and fortune-tellers. This roaming life, of course, tends to keep them separate from the people of the countries in which they are found.

But the chief difference is, that the Gipsies are always ready, when required, to profess the religion of the country, whether Christian or Mohammedan, or any other; seeming to have no religion of their own, and to be quite indifferent on the subject. The Jews, on the contrary, always, when they are allowed, settle in towns along with other men; and are kept distinct from them by their religion, and by nothing else. They are the only people who are everywhere separated from the people of the country in which they live, entirely by their peculiar faith and religious observances; and *that*, too, though their religion is such (which is the strongest point of all) that the most important part of its ordinances,—the sacrifices ordained in their law,—*cannot* be observed by them.

The Jews, therefore, in their present condition, are a kind of standing miracle; being a monument of the wonderful fulfilment of the most extraordinary prophecies that were ever delivered; which prophecies they themselves preserve and bear witness to, though they shut their eyes to the fulfilment of them. No other account than this of the present state and past history of the Jews ever has been, or can be given, that is not open to objections greater than all the objections put together that have ever been brought against Christianity.

This, then, as well as several other difficulties in our religion, such as have been formerly mentioned, will be found, on examination, to be,—even when you cannot fully explain them,—not so much objections against the truth of your religion, as confirmations of it.

And when you do meet with any objection which you are at a loss to answer, you should remember, (as has been above said,) that there are many things which all men must believe, in spite of real difficulties which they cannot explain, when there are much greater difficulties on the opposite side, and when sufficient proof has been offered.

And in the present case, you have seen that it is not only difficult, but impossible, to account for the rise and prevalence of the Christian religion, supposing it not to have come from God. It certainly was introduced and propagated (which no other religion ever was) by an appeal to the evidence of miracles. Nothing but the display of supernatural powers could have gained even a hearing for the Apostles; surrounded as they were by adversaries prejudiced against their religion by their early education and habits of thought, and inclinations, and hopes. And these supernatural powers were, as you have seen, acknowledged at the time by those adversaries; who were driven to attribute the Christian miracles to magic arts.

And you have seen, too, that the religion itself, and the character of Jesus Christ as drawn in the Christian Scriptures, and the whole of the narrative of those books, are quite different, and, indeed, opposite to what might have been expected from impostors or enthusiasts.

And lastly, you have seen that many of the difficulties that have been brought as objections against Christianity, turn out, on careful inquiry, to be an additional evidence of its truth.

Among others, this is remarkably the case with the difficulties relating to the history and condition of the Jewish nation. Though you may not be able fully to explain all the circumstances relating to that wonderful People, you may learn from them, what they refuse to learn from themselves, a strong proof of the truth both of their Scriptures, and of the Gospel which they obstinately reject. It is so ordered by Providence that even that very obstinacy is made to furnish an additional proof of Christianity; by setting them forth before all the world as a monument of fulfilled prophecy.

There are several other instructions and warnings, also, which you may learn from attentively reflecting on the case of the Jews: and I will conclude by shortly mentioning a few of these.

First, you should remember that when you see the Jews, both formerly, and now, obstinately keeping to the faith of their forefathers, merely because it is what they were brought up in, and refusing to listen to any reasoning on the subject of religion, a Christian has no right to wonder at, or to blame, them, if he does the same thing himself; that is, if he is satisfied to take upon trust whatever he may have been told, and is resolved neither to seek nor to listen to any arguments that may enable him "to give a reason of the hope that is in him." And the same may be said of Mohammedans and Pagans, as well as of Jews. Though the Christian happens to have a religion that is right, *he* is not more right than they, if he goes on the same plan that they do. At least, he is right only by chance, if he holds a faith that is true, not *because* it is true, but merely because it is that of his forefathers.

Secondly,—You should remember that we are apt to make much less allowance for the unbelieving Jews than for Christians who lead an unchristian life; and that we *ought* to do just the contrary.

It is difficult for us, of these days, to understand and fully enter into the great difficulty which the Jews had (and still have), in overcoming all the prejudices they had been brought up in, and which were so flattering to their own nation, as God's favoured People. It was a hard task for them to wean themselves from all the hopes and expectations of temporal glory and distinction to that nation; hopes which they and their ancestors had cherished for so many ages. No doubt it was a grievous sin in them to give way to those prejudices, and to reject the Christ as they did. But it is a greater sin to acknowledge Him, as some Christians do, as their Lord and Master, and to "believe that He shall come to be our judge," and at the same time, to take no care to obey his precepts, and copy the pattern of his life. This is more truly impiety than that with which an infidel is chargeable. For suppose two men each received a letter from his father, giving directions for his children's conduct; and that one of these sons, hastily, and without any good grounds, pronounced the letter a forgery, and refused to take any notice of it; while the other acknowledged it to be genuine, and laid it up with great reverence, and then acted without the least regard to the advice and commands contained in the letter: you would say that both of these men indeed were very wrong; but the latter was much the more undutiful son of the two.

Now this is the case of a disobedient Christian, as compared with infidels. He does not, like them, pronounce his father's letter a forgery; that is, deny the truth of the Christian revelation; but he sets at defiance in his life, that which he acknowledges to be the Divine command.

3. Lastly, you should remember that no argument you can bring against unbelievers, will have greater weight with most of them, than a Christian life; and nothing again, will be more likely to increase and confirm their unbelief, than to see Christians living in opposition to the precepts and spirit of the Gospel; and especially to see them indulging bitter and unkind and hostile and uncharitable feelings towards their fellow-creatures, and even their fellow-Christians.

The objection thence raised against the Christian religion, is indeed (as has been above said) not a real and sound one; but still it *will* be raised: and therefore, you cannot too carefully consider how much you will have to answer for, if you contribute to bring an ill name on your Christian faith; and if you do not, on the contrary, endeavour to the utmost, "to adorn the doctrine of God our Saviour, in all things."

AMUSEMENTS IN SCIENCE.

No. VI.

GEOMETRY.—Part 4.

To reduce or enlarge a drawing by means of a simple instrument. Form two flat circles of wood, or of thick pasteboard, of sufficient size to receive the paper on which we are about to make an enlarged copy, or the original, if you intend to make a reduced one.

Fig. 1.

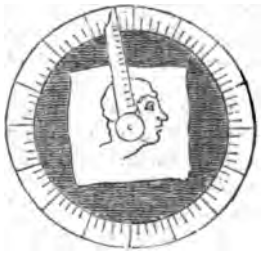

Fig. 2.

Let the outer edge of each of these two circles be divided into any corresponding number of equal parts, with a small hole in the centre of each board to receive a pin, on which a thin piece of brass revolves; this piece of brass is divided, say into twenty-four parts, beginning at the centre, and reaching as far as the inner line of the index on the margin of the circular board. The other circle is furnished with several similar pieces of metal having also twenty-four equal divisions, beginning from the centre; in one case one-half of the distance from the centre to the outer index contains the whole of the twenty-four divisions, in another one-fourth contains the same number, and in another two-thirds.

In order to use this instrument, place the original design on the circle first described, and place the index in its place, the pin, of course, piercing the centre of the paper.

We are supposing now that the drawing is to be reduced, say to one-half its breadth and length. Place a piece of paper sufficiently large on the other circle, and the brass index, on which the twenty-four divisions occupy one-half of its length, in its place on the second circle. Suppose the object to be reduced is a head: place the index on the circle which holds the original drawing, so that it shall exactly cut some particular point in the design, for instance, the corner of the eye. Note which of the twenty-four divisions on the moveable index is opposite to it, and, at the same time, which of the divisions on the circular index is cut by the edge of the straight index. Place the straight edge in the same position on the circle which carries the blank paper.

If the angle of the eye in the original design is opposite the ten on the moveable index, make a dot on the paper opposite the same number of the moveable index of the circle on which the blank paper is placed, and it will show the place of the angle of the eye in the reduced copy. In this manner find as many points as you think necessary for your guidance. If the copy is to be one-fourth the size of the original, use the index in which the twenty-four divisions occupy one-fourth of its length, and so on.

A carpenter having a piece of mahogany of a triangular form, see fig. 3, wished to know how he could cut it up to the best advantage. His first idea was to make an oblong-square table of it, but he found that, if he did so, the waste of the wood would be very great; after consideration, he discovered that the most economical method of using his wood would be to form it into an oval. To make this oval contain as much wood as possible, he proceeded in the following manner: Let B G D be the triangular piece of wood; take G H, one-half of the base, and divide the triangle by drawing a line from H to B; take G H in the compasses, and set it off on one of the sides from G to E, draw the line E F, and the point I will be the centre of the oval; draw K L, parallel to E F, and at the same distance from the centre as the base G D. The points A and C are found by dividing the line from E to K, and drawing A C, or by drawing the dotted lines D A and G C through the centre at I. These points being found, the oval must be completed by the eye of the draughtsman.

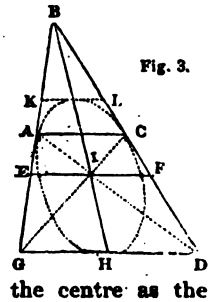

Fig. 3.

In the *Saturday Magazine*, Vol. X., p. 220, in describing the mode of forming a figure of twenty triangular sides, an error occurred in the engraving; two of the triangles forming the sides being omitted. Fig. 4 is a corrected outline.

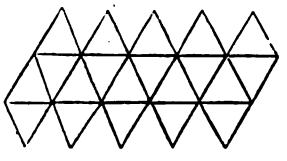
Fig 4.

THERE is hardly a circumstance connected with our existence, which, when examined with a little attention, does not yield abundant evidence of the wisdom and beneficence which preside over the universe. We have only to turn up the soil at our feet, to find in it innumerable seeds useful to man; we have only to look around us upon the surface of the earth, to see it stocked with a variety of animals, conducive not only to our subsistence, but to our convenience and recreation. The sea also, and the air, have their population at our command; and the more deeply we investigate the laws by which the whole system of vegetable and animal life is governed, the more clearly we shall perceive their complete and exclusive adaptation to the planet on which they carry on their operations.—*Quarterly Review.*

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THE

Saturday Magazine.

No. 360. FEBRUARY 10TH, 1838. {PRICE ONE PENNY.

THE ROYAL EXCHANGE OF LONDON.

First erected by Sir Thomas Gresham, in 1566-7.
Visited and named by Queen Elizabeth, 1571.
Destroyed by the Great Fire of London, 1666.
Rebuilt, under the auspices of King Charles the Second, 1668-9.
Destroyed by Fire, January 10, 1838.

VOL. XII

THE ROYAL EXCHANGE, LONDON.

IN most large commercial cities, it has long been the custom that a particular place should be appropriated to the daily meetings of merchants. The name which was first generally applied to such places is *Bourse*, by which they are still known in Paris, Antwerp, St. Petersburg, and other large cities on the continent. The account given of the origin of the name of Bourse, as applied to a place of meeting for merchants, is this. In the city of Bruges there stood a large ancient building, which had been erected by the noble family of *La Bourse*, (signifying Purse in French and Flemish,) whose coat of arms on the walls was three purses. The merchants of Bruges made this old house the place of their daily assemblies; and when they afterwards went to the fairs of Antwerp and Mons, they called the place appropriated in those cities to similar purposes, by the same name as that which they had applied to the place of meeting in their own city, that is to say,—the Bourse. The French merchants also carried the name into the cities of their own country; and even in London the merchants' place of meeting was called Bourse or Burse, until Queen Elizabeth ordered it to be styled the Royal Exchange; and even afterwards retained the original name among foreigners, who styled it the *Bourse Royale*.

The *Bourse* or Burse in London was built by the celebrated merchant, Sir Thomas Gresham *; and before its erection the merchants were accustomed to assemble in the open air in Lombard-street, where they transacted their business, subject to the many inconveniences of such an exposure. That these inconveniences were severely felt is proved by the fact that various schemes were suggested for remedying them; although no active steps appear to have been taken for that purpose until the year 1531. In that year, Sir Thomas Gresham's father, Sir Richard, who enjoyed the honourable distinction of being styled "the King's Merchant," and who was then serving the office of sheriff, wrote to Sir Thomas Audley, the Lord Privy Seal, requesting him to move the king (Henry the Eighth) to direct a letter to be sent to Sir George Monoux, requiring him to sell certain houses in Lombard-street to the mayor and commonalty, for the purpose of erecting a Burse on the ground of the same for the use of the merchants.

Three years after Sir Richard's application, the king sent a letter to the city, directing that a Burse should be built at Leadenhall; but as the Common Council voted that the place of meeting should not be removed from Lombard-street, no further measures were taken.

Thirty years afterwards, when Elizabeth had been seated on the throne about six years, the scheme was revived with greater effect. Sir Thomas Gresham proposed to the corporation of London, in the year 1564—

That if the city would give him a piece of ground in a commodious spot, he, at his own expense, would erect an Exchange, with large and covered walks, wherein the merchants and traders might daily assemble, and transact business at all seasons, without interruption from the weather, or impediments of any kind.

This offer was accepted; and the foundation of the Exchange was laid by Sir Thomas Gresham on the 7th of June 1566. The superstructure was carried on with rapidity, and the whole covered in with slate by November 1567, soon after which the building was "fully finished."

The upper part of this edifice was divided into shops, which were let out by Sir Thomas at a yearly rent. These shops were seven feet and a half long and five feet broad; from the smallness of their size, it often happened that the same person rented more than one. There were likewise at first, other shops fitted up in the vaults below; but these being found very inconvenient by reason of their dampness and want of light, the vaults were soon let out to other uses. An entry in the Ward-book of Cornhill, under the year 1594, gives us some information as to the manner in which the vaults were then appropriated; it runs thus,—

Presented William Grimbel for keping typlinge in the vaults under the Exchange, and for broyling of *herringes*, *sprotts*, and *bacon*, and other thinges in the same vaults noisome to the merchants and others resortinge to the Exchange.

The number of the upper shops was one hundred and twenty; which, when the vaults had been detached from them, "paid, one with another, a rent of four pounds ten shillings a year, upon leases of twenty-one years." Ward, in his *Life of Gresham*, says, that the tenants placed in them by Sir Thomas were "chiefly young men of small fortunes, but industrious, who, by their diligence, brought great business to their shops, and employed some thousands of poor people in working our manufactures." It would seem, however, that they were not at first very prosperous; for when Elizabeth visited the Exchange, three years after its erection, so many of the shops were unoccupied that Sir Thomas found it necessary to go round among the shopkeepers and entreat them "to furnish and adorne with wares and wax-lights, as many shoppes as they either coulde or woulde, and they should have all those so furnished, rent free for that year." Some time afterwards, Stow's *Continuator*, speaking of this Exchange says, "it is as plenteously stored with all kinde of rich wares and fine commodities as any particular place in Europe; into which place many forraine princes daily send to be best served of the best sort." The same authority enumerates among the tenants of the shops of that period, haberdashers, armourers, apothecaries, booksellers, goldsmiths, and globe-sellers.

The visit mentioned above as having been paid by Queen Elizabeth to the Bourse in 1571, was the occasion of its obtaining the name of "Royal Exchange," by which it has ever since been known. Her Majesty went into the city to dine with Sir Thomas Gresham, and on her return inspected it.

The three and twentieth of Januarie, [1571,] the Queene's Majestie, accompanied with her nobility, came from her house at the Strand, called Summerset-place, and entered the citie of London by Temple Bar, Fleet-street, Cheape, and so by the north side of the Bursse, to Sir Thomas Gresham's in Bishopsgate-street, where she dined. After dinner, her Grace returning through Cornhill, entered the Bursse on the south side; and after her Highness had viewed every part thereof above ground, especially the Pawne, which was richlie furnished with all sorts of the finests wares in the citie, she caused the same Bursse by an herald to be proclaimed *The Royal Exchange*, so to be called from thenceforth and no otherwise.

A curious tradition has been preserved relative to this visit,—namely, that Sir Thomas, before the Queen came to his house, purchased of a foreigner a costly pearl, which, on account of its high price, had been refused by several persons of the first quality, that he caused it to be reduced to powder, and during the entertainment drank it up in a glass of wine. The tradition is embodied in an historical play in which Gresham thus speaks,—

> Here fifteen hundred pound at one clap goes,
> Instead of sugar Gresham drinkes this pearle
> Unto his queen and mistress: pledge it lords.

This story, (says Dr. Ward,) has been handed down by tradition as a real fact, but as I find no historical proof of

* See *Saturday Magazine*, Vol. II., p. 225.

it, I would not be thought to mention it as a thing probable, but only to show upon what evidence it depends; for it seems no way agreeable to the character of Sir Thomas, who always knew how to make the best use of his money.

Sir Thomas Gresham died on the 21st of November, 1579, and by his will bequeathed "the building called the Royal Exchange, with all the pawns and shops, cellars, vaults, messuages, tenements, and other hereditaments" belonging to it, after the determination of the particular uses, estates, and interest for life, and entail thereof, upon the Lady Anne his wife, "jointly for ever to the Corporation of London and the Company of Mercers;" upon trust that the citizens out of their moiety should pay salaries of 50*l.* per annum each to four professors, who should read public lectures gratuitously on Divinity, Astronomy, Geometry, and Music, at his Mansion-house between Bishopsgate-street and Broad-street, afterwards called Gresham College; 6*l.* 13*s.* 4*d.* per annum each, to eight alms-people living behind the said mansion; and 10*l.* annually to each of the prisons of Newgate, Ludgate, the Marshalsea, King's Bench, and Wood-street Compter:—and that the Mercers out of their moiety should pay annual salaries of 50*l.* to each of three persons who should read lectures on Law, Physic, and Rhetoric, at his Mansion-house; 100*l.* for four dinners quarterly, at their own hall, and 10*l.* yearly to Christ's, St. Bartholomew's, St. Thomas's, and Bethlem Hospitals, the Spital and the Poultry Compter.

Lady Gresham continued to receive the emoluments arising from the Royal Exchange, in rents, fines, &c., until her decease, in 1596, before which time they amounted to 751*l.* 5*s.*

The Exchange built by Sir Thomas Gresham, was nearly destroyed in the Great Fire of 1666, not quite one century after its completion. Evelyn, in his account of this awful calamity, laments "the Sumptuous Exchange;" he tells us also, that "Sir Thomas Gresham's Statue, though fallen from its niche in the Royal Exchange, remained entire, when all those of the kings since the Conquest, were broken to pieces." Another eye witness of the great fire, the Rev. T. Vincent, after remarking in his *God's Terrible Voice in the City*, that no stately building was so great as to resist the fury of the flames, continues:

The Royal Exchange itself, the glory of merchants, is now invaded with much violence: when the fire was entered, how quickly did it run round the galleries, filling them with flames: then descending the stairs, compasseth the walks, giving forth flaming vollies, and filling the court with sheets of fire; by and by the kings fell all down upon their faces, and the greatest part of the building after them (the *Founder's statue* only remaining), with such a noise as was dreadful and astonishing.

In an old work styled the "Burning of London in the year 1666, commemorated and improved in a CX. Discourses, Meditations, and Contemplations, by Samuel Rolle, Minister of the Word, and sometime Fellow of Trinity Colledge in Cambridge," we find some curious and interesting remarks upon this subject. In the third part which treats of "the most remarkable passages and circumstances of that dreadful fire," Meditation IX. is *Upon the burning of the Royall Exchange.*

What a princely foundation (says the writer,) was that *Royal Exchange!* and of how great use? Was not that the center in which those lines met that were drawn from all parts of Europe? rich merchants, I mean, and other eminent tradesmen and great dealers, not merely English but Spanish, French, Dutch, Portugueze, Danes, Swedes. Was not the place a little epitomie or rather representative of all Europe (if not of the greatest part of the trading world,) renewed every day, at such a time, and for so many hours? As London was the glory of England, so was that *Royal Exchange* one of the greatest glories and ornaments of London. There were the statues of the kings and queens of England set up, as in the most conspicuous and honourable place (as well receiving lustre from the place where they stood as giving lustre to it.)

How full of riches was that *Royall Exchange.* Rich men in the midst of it, rich goods both above and beneath. There men walk't upon the top of a wealthy mine; considering what Eastern treasures, costly spices, and such like things, were laid up in the bowels, (I mean the cellars,) of that place. As for the upper part of it, was it not the great storehouse whence the nobility and gentry of England were furnished with most of those costly things, wherewith they did adorn either their closets or themselves?

About the space of nineteen months, was that Royall Exchange in building, viz., from June 7th till November in the year following. So that the sunne had finished his annual course once, and almost a second time, ere that work was finished; but was it so many hours in burning as it was months in building?

When this Exchange was burned in 1666 the amount of funds belonging to the trust in the possession of the trustees was only £234. 8*s.* 2*d.*; yet they soon began the work of rebuilding.

The plans and elevations were submitted to Charles the Second in September, 1667, and, on the 23rd of October, the king laid the base of the column on the west side of the north entrance; after which he and his suite were plentifully regaled, under a temporary shed upon the Scotch walk, "with a chine of beef, fowls, hams, dried tongues, anchovies, cavaire, and wines." On the 31st of the same month, the first stone of the column on the east side of the north entrance was laid by the Duke of York, afterwards James the Second, and on the 18th of November, the foundation-stone of the eastern column of the south entrance was laid by Prince Rupert. The architect employed was Mr. Edward Jerman, and not as has been often stated, Sir Christopher Wren; the work was diligently superintended by the joint committee of the Mercers' Company and the Corporation of London, appointed for that purpose by those bodies.

The following official entry was inserted in the books by an order dated Dec. 16, 1667:—

A letter from the Right Honourable the Earl of Manchester, recommending one Caius Gabriel Cibber to the making the statues for the Royal Exchange, and the rather in regard he hath shown his Majesty some models which have been well liked of, having been read; the committee called the gentleman in, and acquainted him that the business of making the statues is yet very much from their thought, having the whole Exchange to build first; and that a new committee will succeed before the main work be effected, to whom, when fitting time shall come, he may do well to apply himself.

Cibber seems to have taken their advice, for he did execute most of the statues.

During the period occupied by the rebuilding of this edifice, the merchants held their meetings at Gresham College, but when the works were sufficiently advanced, they took possession of the New Exchange, which was first publicly opened on the 28th of September, 1669.

The whole cost of rebuilding the edifice was 58,962*l.* Considerable repairs have, at times, been made in this edifice. In the year 1767 Parliament voted 10,000*l.* for the purpose; and it was then found necessary almost to rebuild the western side. But the most extensive reparations and improvements which this fabric has ever undergone were made between the years 1820 and 1826, from the designs and under the superintendence of Mr. George Smith, architect to the Mercers' Company. These consisted of building a new stone tower on the north front, in place of a more lofty one of timber; constructing three new stone staircases of large dimensions; chipping, scraping, and repairing the entire surface

of the edifice; repairing the sculptured figures and scroll-work, the roof, galleries, shops, &c., in short, of renovating the whole structure. The aggregate expenses amounted to about 33,000*l.*, of which the the stone staircases and floors alone cost 6000*l.*

The old tower was a lofty structure, being one hundred and seventy-eight feet in height; it consisted of three stories, with grouped columns and pilasters of the Corinthian and composite orders at the angles. The lower story was stone, the upper stories of timber, finished by a cupola, on which was sustained a ponderous weathercock, in the form of a grashopper. It was a most singular design, and strikingly dissimilar to the various church towers. The tower which replaced it in 1821, and the shell of which remained still standing after the recent conflagration, was only one hundred and twenty-eight feet six inches in height.

Within the area, on the four interior sides of the building, were twenty-five large niches, containing figures of twenty-two of our sovereigns, namely:—on the south side, Edward the First, Edward the Third, Henry the Fifth, and Henry the Sixth; on the west, Edward the Fourth, Edward the Fifth, Henry the Seventh, and Henry the Eighth; on the north, Edward the Sixth, Queen Mary, Queen Elizabeth, James the First, Charles the First, Charles the Second, and James the Second; on the east, within a conjoined or double niche, were William and Mary; George the First, George the Second, George the Third, and George the Fourth.

Such, then, was the Royal Exchange of London, when, on the night of Wednesday, the 10th of January last, it fell a prey to the flames. Soon after ten o'clock on that night, a fire broke out in the north-eastern corner of the edifice; it spread with rapidity towards the west, and in the space of a few hours had made a complete circuit of the quadrangle, destroying, in succession, the northern, western, southern, and eastern sides of the building. Of the tower which rose above the principal entrance on the southern side, the shell alone was left standing; and some of the decorations of the portico above that entrance sustained but little injury. The statue of Charles the Second, which stood in the middle of the area within, was not destroyed; but as the inner walls fell, they carried with them all the royal statues which had formed so conspicuous a feature among their ornaments.

It is of course very improbable that any length of time will elapse before the City of London, be provided with another "Royal Exchange;" and there is little reason to doubt that the new edifice will surpass its predecessor in magnificence. The regrets of some, that "we have not a Sir Christopher Wren to rebuild it now," may be dissipated by the fact, that Sir Christopher Wren had nothing to do with rebuilding it before; and little danger we should trust is to be apprehended of our inability to produce as skilful an artist as Mr. Edward Jerman, notwithstanding that he was considered by the committee in 1667, (when Sir Christopher Wren was living,) to be "the most able known artist," next to "Mr. Mills the city surveyor." At all events, there is little hazard in predicting, that ere long a new edifice will be erected, and in the conceited doggrel of an old ballad, written soon after the Great Fire of 1666,—

> Th' Exchange, that Royal Infant, shortly will
> Her own and forreign language speak with skill,
> And on that acre the noon sun shall see,
> All his long travels in epitomie.

THAT which is good to be done, cannot be done too soon; and if it is neglected to be done early, it will frequently happen that it will not be done at all.—BISHOP MANT.

VEGETABLE PRODUCTIONS OF VARIOUS CLIMATES.

How various are the climates of the earth, and yet how uniform is each climate in its temperature, notwithstanding the fact, that we traverse annually a circle in space whose diameter extends over one hundred and ninety millions of miles. In each particular climate we behold races of animals and plants, many of which would not prosper elsewhere. Though apparently rains, and winds, and frosts are very irregular, yet we find a remarkable constancy in the average of the weather and seasons of each place. Very hot summers, or very cold winters, have little effect in raising or depressing the mean annual temperature of any one climate above or below its general standard. We must be convinced, from observation, that the structure of plants, and the nature of many animals, are specially adapted to the climate in which they are located. A vegetable, for example, which flourishes when the mean temperature is fifty-five degrees, would perish where the average is only fifty. If our mean temperature were raised or lowered by five degrees, our vegetable world would be destroyed, until a new species suited to the altered climate, should be substituted for that which we possess at present. An inhabitant of the equatorial regions, whose mean temperature is eighty, would hardly believe that vegetable life could exist in such a climate as ours. We have the same opinion of the arctic regions. But both are equally mistaken; the care of a presiding Providence is limited to no climate; it

> Lives through all space, extends through all extent,
> Spreads undivided, operates unspent.

At the equator we find the natives of the Spice Islands, the clove, and nutmeg trees, pepper and mace. Cinnamon bushes clothe the surface of Ceylon; the odoriferous sandal-wood, the ebony-tree, the teak-tree, and the banyan grow in the East Indies. In the same latitudes, in Arabia the Happy, we find balm, frankincense, and myrrh, the coffee-tree and the tamarind. But in those countries, at least in the plains, the trees and shrubs which decorate our more northerly climes are wanting. And as we go northwards, at every step we change the vegetable group, both in addition and by subtraction. In the thickets to the west of the Caspian Sea we have the apricot, citron, peach, walnut. In the same latitude, in Spain, Sicily, and Italy, we find the dwarf plum, the cypress, the chestnut, the cork-tree; the orange and lemon-tree perfume the air with their blossoms; the myrtle and pomegranate grow wild among the rocks. We cross the Alps, and we find the vegetation which belongs to Northern Europe, of which England is an instance. The oak, the beech, and the elm, are natives of Great Britain; the elm-tree seen in Scotland and the north of England is the wych-elm. As we travel still farther to the north, the forests again change their character. In the northern provinces of the Russian empire are found forests of the various species of firs, the Scotch and spruce-fir, and the larch. In the Orkney Islands no tree is found but the hazel, which occurs again on the shores of the Baltic. As we proceed into colder regions, we still find species which appear to have been made for these situations. The hoary or cold elder makes its appearance north of Stockholm; the sycamore and mountain-ash accompany us to the head of the Gulf of Bothnia; and as we leave this, and traverse the Dophrian range, we pass in succession the boundary lines of the spruce-fir, the Scotch-fir, and those minute shrubs which botanists distinguish as the dwarf-birch and the dwarf-willow. Here, near to, or within the arctic circle,

we yet find wild flowers of great beauty,—the mezereon, the yellow and white water-lily, and the European globe-flower. And when these fail us, the reindeer-moss still makes the country habitable for animals and man.

So also there are boundaries to the growth of corn, the vine, and the olive. Wheat extends over certain tracts from England to Thibet; it does not flourish in the polar regions, nor within the tropics, except in situations considerably raised above the level of the sea. The temperature required for the cultivation of the vine must not be under fifty, nor much above sixty-three degrees, though, in the warm climates, elevation of situation will correct the excess of heat.

Maize and olives have their favourite regions in France, Italy, and Spain. We first meet with rice west of Milan; it extends over the northern provinces of Persia, and over all the southern districts of Asia, where there are facilities for irrigation.

Millet is one of the principal grains of Africa. Cotton is cultivated in the New World no higher than forty degrees latitude; in the Old it extends to latitude forty-four degrees, being found in Astrachan. Exceptions, indeed, occur with respect to the sugar-cane, the indigo-tree, the plantain, and the mulberry, all natives of India and China; for these productions have found a genial climate in the West Indies and South America. The genuine tea-tree seems indisposed to flourish out of China, though the South American Indians have something like it. The Cassava yams, the bread-fruit-tree, the sago-palm, and the cabbage-tree, are all apparently special provisions for the islands in which they are peculiarly found to flourish.

It is impossible, we think, to reflect upon all this variety of natural wealth, and upon the adaptation of each species to the climate in which it is found, without perceiving that the distribution of those productions,—no one climate yielding a perfect substitute, generally speaking, for that of another,—was originally designed to prompt and to continue throughout human existence, that commercial and friendly intercourse which has been long since established between the inhabitants of countries the most remote from each other.——*Quarterly Review.*

ON READING WORKS OF IMAGINATION.

THERE has been considerable difference of opinion in regard to the effects produced upon the mind by fictitious narratives. Without entering minutely upon the merits of this controversy, I think it may be contended that two evils are likely to arise from much indulgence in works of fiction. The one is a tendency to give way to the wild play of the imagination, a practice most deleterious both to the intellectual and moral habits. The other is a disruption of the harmony which ought to exist between the moral emotions and the conduct,—a principle of extensive and important influence. In the healthy state of the moral feelings, for example, the emotion of sympathy excited by a tale of sorrow, ought to be followed by some efforts for the relief of the sufferer. When such relations in real life are listened to from time to time without any such efforts, the emotion gradually becomes weakened, and that moral condition is produced which we call selfishness, or darkness of heart. Fictitious tales of sorrow appear to have a similar tendency,—the emotion is produced without the corresponding conduct; and, when this habit has been much indulged, the result seems to be, that a cold and barren sentimentalism is produced, instead of the habit of active benevolence. If fictitious narratives be employed for depicting scenes of vice, another evil of the greatest magnitude is likely to result from them, even though the conduct exhibited should be shown to end in remorse and misery. For by the mere familiarity with vice, an injury is done to the youthful mind, which is in no degree compensated by the moral at the close. Imagination, therefore, is a mental power of extensive influence, and capable of being turned to important purposes in the cultivation of individual character. But to be so, it must be kept under the strict control of reason and of virtue. If it be allowed to wander at discretion, through scenes of imagined wealth, ambition, frivolity, or pleasure, it tends to withdraw the mind from the important pursuits of life, to weaken the habits of attention, and to impair the judgment. It tends in a most material manner, to prevent the due exercise of those nobler powers which are directed to the cultivation both of science and virtue.

The state of a mind which has yielded itself to the influence of this delusive habit, cannot be more forcibly represented than in the words of an eloquent writer:—

The influence of this habit of dwelling on the beautiful fallacious forms of imagination, will accompany the mind into the most serious speculations, or rather, musings, on the real world, and what is to be done in it, and expected; as the image which the eye acquires from looking at any dazzling object, still appears before it wherever it turns. The vulgar materials that constitute the actual economy of the world, will rise up to its sight in fictitious forms, which it cannot disenchant into plain reality, nor will even suspect to be deceptive. It cannot go about with sober, rational inspection, and ascertain the nature and value of all things around it. Indeed, such a mind is not disposed to examine, with any careful minuteness, the real condition of things. It is content with ignorance, because environed with something more delicious than such knowledge, in the paradise which imagination creates. In that paradise it walks delighted, till some imperious circumstance of real life call it thence, and gladly escapes thither when the avocation is past. There everything is beautiful and noble, as could be desired to form the residence of an angel. If a tenth part of the felicities that have been enjoyed, the great actions that have been performed, the beneficent institutions that have been established, and the beautiful objects that have been seen in this happy region, could have been imported into this terrestrial place, what a delightful thing it would have been to awake each morning to see such a world once more.

To the same purpose are the words of another writer of the highest authority:—

To indulge the power of fiction, and send imagination out upon the wing, is often the sport of those who delight too much in silent speculation. He who has nothing external that can divert him, must find pleasure in his own thoughts, and must conceive himself what he is not,—for who is content with what he is? He then expatiates in boundless futurity, and culls from all imaginable conditions that which, for the present moment, he should most desire; amuses his desires with impossible enjoyments, and confers upon his pride unattainable dominion. The mind dances from scene to scene, unites all pleasures in all combinations, and riots in delight which nature and fortune, with all their bounty, cannot bestow. In time, some particular train of ideas fixes the attention; all other intellectual gratifications are rejected; the mind, in weariness or leisure, recurs constantly to the favourite conception, and feasts on the luscious falsehood whenever she is offended with the bitterness of truth. By degrees the reign of fancy is confirmed; she grows first imperious, and in time despotic. Then fictions begin to operate as realities, false opinions fasten upon the mind, and life passes in dreams of rapture or of anguish.

[ABERCROMBIE *on the Intellectual Powers.*]

WHATEVER God himself has pleased to think worthy of his making, its fellow-creature man should not think unworthy of his knowing.—BOYLE.

FROSTS, AND FROST FAIRS, UPON THE RIVER THAMES.

WITHIN the last eight hundred years several instances are recorded in our history of frosts so severe as to render the surface of the Thames, at London, one immoveable mass of ice; the last of them occurred within the memory of the present generation. Upon these occasions the river has been the scene of diversions and amusements, remarkable indeed, not so much in themselves, as from the nature of the place in which they were practised.

As early as 1092, in the reign of William Rufus, is recorded a frost "whereby," in the words of an old chronicler, "the great streams [of England] were congealed in such a manner that they could draw two hundred horsemen and carriages over them; whilst at their thawing, many bridges, both of wood and stone, were borne down, and divers water-mills were broken up, and carried away." In 1281, is mentioned another frost and snow "such as no man living could remember the like;" five arches of London-bridge were on this occasion "borne downe and carried away with the streame."

The winter of 1564-5 was remarkable for a very severe frost which began on the 21st of December, and according to Holinshed continued to such an extremity, that on New Year's Eve "people went over and alongst the Thames on the ise from London-bridge to Westminster."

Some plaied at the football as boldlie there as if it had beene on the drie land; diverse of the Court being then at Westminster, shot dailie at prickes set upon the Thames; and the people, both men and women, went on the Thames, in greater numbers, than in anie street of the Citie of London. On the third daie of January, at night, it began to thaw, and on the fift there was no ise to be seene betweene London Bridge and Lambeth, which sudden thaw caused great floods and high waters, that bare downe bridges and houses, and drowned manie people, in England; especiallie in Yorkshire, Owes Bridge was borne awaie with others."

The next remarkable frost recorded is that of 1608. It begun on the 8th of December, and continued until the 15th; a thaw then ensued until the 22nd, when it began "againe to freeze violently, so as divers persons went halfe way over the Thames upon the ice; and the 30th of December, at every ebbe, many people went quite over the Thames in divers places, and so continued until the 3rd of January."

The people passed daily betweene London and the Bankside at every halfe ebbe, for the floud removed the ice and forced the people daily to tread new paths, except onely betweene Lambeth and the ferry at Westminster, the which, by incessant treading, became very firm, and free passage, untill the great thaw; and from Sunday, the tenth of January, until the fifteenth of the same, the frost grew so extreme, as the ice became firme, and removed not, and then all sorts of men, women, and children, went boldly upon the ice in most parts; some shot at prickes; others bowled and danced, with other variable pastimes, by reason of which concourse of people, there were many that set up boothes and standings upon the ice, as fruit-sellers, victuallers, that sold beere and wine, shoomakers, and a barber's tent, &c."

In these tents were fires. The ice lasted till the afternoon of the 2nd of February, when "it was quite dissolved and clean gon."

In the winter of 1683-4 the festivities of a frost fair were again witnessed on the Thames at London. The frost commenced in the beginning of December, and lasted until the 5th of February. The river was congealed to that degree, that another city, as it were, was created thereon; where, by the great number of streets, and shops, with their rich furniture, it represented a great fair, with a great variety of carriages, and diversions of all sorts; and near Whitehall, a whole ox was roasted on the ice."

Evelyn, however, who was an eye-witness of this scene, furnishes the following extraordinary account of it in his *Diary*, of January the 24th.

The frost continuing more and more severe, the Thames before London was still planted with boothes in formal streetes, all sortes of trades and shopes furnish'd, and ful of commodities, even to a printing-presse, where the people and ladyes tooke a fancy to have their names printed, and the day and yeare set down when printed on the Thames: this humour tooke universally, that 'twas estimated the printer gain'd 5*l.* a day, for printing a line onely, at sixpence a name, besides what he got by ballads, &c. Coaches plied from Westminster to the Temple, and from several other staires to and fro, as in the streetes; sleds, sliding with skertes, a bull-baiting, horse and coach races, puppet-plays, and interludes, cookes, tipling, and other places, so that it seem'd to be a bacchanalian triumph, or carnival on the water.

Upon this occasion king Charles the Second, his queen, and several other personages of the Royal Family visited the diversions upon the ice; and even had their names printed on the ice in conformity with the "humour" which Evelyn mentions as so prevalent. There is still in existence one of the very papers on which the king and his royal companions had their names printed; and we need hardly say that among collectors of the curious, it is regarded as an invaluable rarity. It contains the names of "Charles, king;" his brother "James, duke" (of York) afterwards James II.; "Katherine Queen" the Infante of Portugal; "Mary, Dutchess;" Mary D'Este, sister of the duke of Modena, and second wife of James; "Ann, Princesse," second daughter of the duke of York, afterwards Queen Anne; and "George, Prince" of Denmark, her husband. The king's visit is thus noticed in a small poem printed on the river, entitled *Thamasis's Advice to the Painter from her Frigid Zone, or Wonders upon the Water.*

Then draw the *King*, who on his *Leads* doth stay,
To see the *Throng* as on a *Lord Mayor's day*;
And thus unto his *Nobles* pleas'd to say;
With these *Men* on this *Ice*, I'de undertake
To cause the *Turk* all *Europe* to forsake:
An army of these *Men*, arm'd and compleat,
Would soon the *Turk* in *Christendom* defeat!

The same poem contains the following advice to its readers:—

..... to the *Print-house* go
Where *Men* the *Art of Printing* soon do know:
Where for a *Teaster* you may have your *Name*
Printed, hereafter for to show the same;
And sure in *former Ages* ne'er was found
A *Press* to *print* where men so oft were dround!

In 1709 the Thames was again frozen over at intervals, and some persons crossed on the ice, but the frost was not sufficiently permanent to allow another Frost Fair. But in 1715-6 all the sports of 1683 were renewed, the frost beginning at the end of November, and lasting till the 9th of February following.

Our engraving represents a view of the memorable Frost Fair on the Thames in the Winter of 1739–40, the most severe which had occurred since the year 1716. In the beginning of it, the houses then standing on London Bridge received considerable damage from the many vessels which broke from their moorings and lay beating against them. On the 31st of December, it was announced in one of the newspapers that "all the watermen above the bridge have hauled their boats on shore, the Thames being very nigh frozen over." The "rocks" and "shoals" of ice which for some time floated on the river, became at length united into one solid mass, and represented "a snowy field everywhere rising in masses and hills of ice and

snow." Tents and printing-presses were speedily erected, and a complete Frost Fair was once more established; but some persons lost their lives in walking over the river. Among the productions of the press upon this occasion, were the following lines "Printed on the Ice upon the Thames at Queenhithe, January the 29th, 1739–40."

Behold the liquid THAMES now frozen o'er
That lately SHIPS of mighty burden bore.
Here you may PRINT your name tho' cannot write
'Cause numb'd with cold: 'Tis done with great delight.
And lay it by; That AGES yet to come
May see what THINGS upon the ICE were done.

In one of the newspapers for the 2nd of January, it was announced that—

Several vintners in the Strand bought a large ox in Smithfield on Monday last, which is to be roasted whole on the ice on the River of Thames, if the frost continues.

Mr. Hodgeson, a butcher in St. James's Market, claims the privilege of selling, or knocking down, the beast, as a right inherent in his family, his father having knocked down the ox roasted on the river, in the great Frost, 1684; as himself did that roasted in 1715, near Hungerford-stairs. The beast is to be fixed to a stake in the open market, and Mr. Hodgeson comes dressed in a rich laced cambric apron, a silver steel, and a hat and feathers to perform the office.

The breaking up of this famous frost was attended with some amusing scenes; it is thus noticed in a newspaper of January 22nd:—

Yesterday morning the inhabitants of the west prospect of the bridge were presented with a very odd scene; for, on the opening of their windows there appeared underneath, on the river, a parcel of booths, shops, and huts, of different forms, and without any inhabitants, which, it seems, by the swell of the waters, and the ice separating, had been brought down from above. As no lives were lost, it might be viewed without horror. Here stood a booth with trinkets, there a hut with a dram of old gold; in another place, a skittle-frame and pins, and in a fourth "the Noble Art and Mystery of Printing, by a servant to one of the greatest trading companies in Europe." With much difficulty last night, they had removed the most valuable effects.

In 1768 another remarkable frost took place, and in 1785 another, which lasted for one hundred and fifteen days. In 1789 the Thames was again frozen over, and a Fair held on the ice, several booths being erected on the 9th of January. Passages across the ice, strewed with ashes, were formed at Gun-dock, Execution-dock, &c., and these parts seem to have constituted the principal scenes of attraction.

No sooner, (says a contemporary chronicle,) had the Thames acquired a sufficient consistency, than booths, turn-abouts, &c. &c., were erected; the puppet-shows, wild beasts, &c., were transported from every adjacent village; whilst the watermen, that they might draw their usual resources from the water, broke in the ice close to the shore, and erected bridges, with toll-bars, to make every passenger pay a halfpenny for getting to the ice. One of the suttling-booths has for its sign, "Beer, Wine, and Spirituous Liquors, without a License." A man who sells hot gingerbread, has a board, on which is written, "no shop-tax nor window duty." All the adventurers contend, in these short sentences, for the preference of the company; and the Thames is in general crowded.

Another specimen of the humour exhibited at this place, was contained in the following inscription on a temporary building on the Thames:—"This Booth to Let. The present possessor of the premises is Mr. Frost. His affairs, however, not being on a permanent footing, a dissolution or bankruptcy may soon be expected, and the final settlement of the whole intrusted to Mr. Thaw." On Wednesday, January the 7th, a large pig was roasted on one of the principal roads; and on Monday, the 12th, a young bear was hunted on the ice, near Rotherhithe. As usual, too, a printing-press was erected near the same spot; the following is one of the Bills printed "on the ice, at the Thames Printing Office, opposite St. Catherine's Stairs:"—

The silver Thames was frozen o'er,
No difference 'twixt the stream and shore,
The like no Man hath seen before
Except he lived in days of yore.

The frost was severely felt to a great distance down the river; the East India ships were hastily sent down to Gravesend, to which place, and even below it, large shoals of ice had floated. The navigation of boats was entirely stopped, and it was supposed that the river would soon be completely impassable from London Bridge to Woolwich. Every morning at London Bridge, vast quantities of boiling water were poured on the water-works before the wheels could be set in motion; and twenty-five horses were daily employed in removing the ice which surrounded them. At Blackfriars, the masses of floating ice were said to be eighteen feet in thickness; the surface of the river in some places was "smooth for a mile or two," and then "rough and mountainous" from the bodies of frozen snow. Putney and Fulham, "from the morning dawn till the dusk of returning evening, were a scene of festivity and gaiety."

The thaw which followed this frost was rapid. It had been for some time expected, and at length it commenced with some rain about two o'clock on Tuesday, January the 13th; and before night, the streets were almost overflowed.

Perhaps, (says a newspaper of the time,) the breaking up of the Fair upon the Thames last Tuesday night below bridge, exceeded every idea that could be formed of it, as it was not until after the dusk of the evening, that the busy crowd was persuaded of the approach of a thaw. This, however, with the cracking of some ice about eight o'clock, made the whole a scene of the most perfect confusion; as men, beasts, booths, turn-abouts, puppet-shows, &c. &c., were all in motion, and pouring towards the shore on each side. The confluence here was so sudden and impetuous, that the watermen who had formed the toll-bars over the sides of the river, where they had broken the ice for that purpose, not being able to maintain their standard from this crowd, &c., pulled up the boards, by which a number of persons who could not leap, or were borne down by the press, were soused up to the middle. The difficulty of landing at the Tower-stairs was extreme, until near ten o'clock, occasioned by the crowding of the people from the shore, who were attracted by the confusion on the water. The inconvenience to the shipping is now increased more than ever, since the setting in of the frost, as no persons will venture upon the ice to fetch or carry anything for them, and it is not yet sufficiently disunited for a boat to live.

The last Frost Fair upon the River Thames at London, was held in the beginning of the year 1814. The frost commenced on the evening of the 27th of December preceding, with a thick fog which lasted for several days, and was suceeded by a remarkably heavy fall of snow, which continued for nearly two days with slight intermissions. The cold became intense, the wind blowing almost constantly from the north and north-east; the river was covered with vast fragments of ice and hardened snow, which floated along with the tide, and sometimes united to form a hard and fixed mass. After this frost had lasted for a whole month, a thaw of four days, from the 26th to the 29th of January, took place; and so large a quantity of ice was floated down in detached pieces, that the river between Blackfriars and London Bridges, became almost impassable. But this thaw was succeeded by a renewal of the frost, so severe, that the Thames very soon became one immoveable sheet of ice; and even on Sunday, the 30th, was crossed by some venturous persons on foot in different parts. On Tuesday, the 1st of February, the usual entries were formed by the unemployed water-

men, particularly between Blackfriars Bridge and Three Cranes Wharf; and notices were posted in the streets leading thereto, announcing a safe footway over the river. It is said that many of the watermen received six pounds in the day by the toll which they took from persons passing over their little bridges, from the edge of the river to the firm ice.

The standing amusements of an English Frost Fair now commenced, (says Mr. Richard Thomson in his *Chronicles of London Bridge*,) and many cheerfully paid to see and partake of that upon the frozen Thames, which at any other time they would not have deigned to look upon. Beside the roughly-formed paths paved with ashes, leading from shore to shore, there was a street of tents called the "City Road," in which gay flags, inviting signs, music and dancing, evinced what excellent entertainment was to be found there. That ancient wonder, peculiar to the place, the roasting of a small sheep over a fire, was exhibited to many a sixpenny audience, while the provision itself, under the name of "Lapland Mutton," sold for one shilling a slice! Several printing-presses were also erected to furnish memorials of the Frost in old verse and new prose.

Some of these papers are amusing; especially those which apostrophize the Printing-press in its novel situation:—

> You that walk here, and do design to tell
> Your children's children what this year befell
> Come buy this print, and then it will be seen,
> That such a year as this hath seldom been.

The logical precision of the inference in the last two lines of this effusion, is not more curious than the following grandiloquent burst of panegyric upon the Press.

OMNIPOTENT PRESS! Tyrant Winter has enchained the noblest torrent that flows to the main; but Summer will return and set the captive free. So may tyranny for a time "freeze the genial current of the soul;" but a Free Press, like the great source of light and heat, will, ere long, dissolve tyranny of the mightiest. Greatest of the arts! What do we not owe to thee? The knowledge which directs industry, the liberty which encourages it, the security which protects it, and of industry how precious are the fruits! Glowing and hardy temperaments, which defy the vicissitudes of seasons, and comfortable homes which make you regret not the gloom that is abroad. But for Industry, but for Painting, you might now have been content, like the Russ and Laplander, to bury yourselves under that snow over which you now tread with mirth and glee. Printed on the River Thames, and in commemoration of a great fair held upon it on the 31st of January, 1814, when it was completely frozen over from shore to shore. The frost commenced the 27th of December, 1813, and was accompanied by a thick fog that lasted eight days; and after the fog, came a heavy fall of snow, that prevented all communication with the northern and western parts of the country for several days.

Another bill upon the same subject, containing fewer reflections and more humour, promises that the press shall be kept going "in the true spirit of liberty,"—if the public buy impressions.

Friends! Now is your time to support the freedom of the Press! Can the Press have greater liberty? Here you find it working on the middle of the Thames; and if you encourage us by buying our impressions, we will keep it going in the true spirit of liberty during the frost.

One of the last papers printed on the river ran thus:—

TO MADAM TABITHA THAW.]

Dear Dissolving Dame.

FATHER FROST and SISTER SNOW have *bonyed* my borders, formed an *idol of ice* upon my bosom, and all the LADS OF LONDON come to make merry; now, as you love mischief, treat the multitude with a few CRACKS by a sudden visit, and obtain the prayers of the poor upon both banks.

Given at my own Press, the 5th of February 1814.

THOMAS THAMES.

Upon the evening of the very day on which this invocation was printed, "Madam Tabitha Thaw," suddenly made her appearance with a fall of rain; the ice cracked and floated in several places, and about two o'clock on the following day, the tide, which during the frost had apparently not risen above half its usual height, began to flow very rapidly. The river was covered with detached masses of ice, and every vestige of this last Frost-Fair speedily disappeared.

The features of this British Carnival (said Mr. Thomson a few years ago,) are in the memories of the greater part of the present generation; though if it were otherwise, the representations of it are few and scarce, and generally very inferior.

FROST FAIR ON THE RIVER THAMES,
1739-40.

LONDON: Published by JOHN WILLIAM PARKER, West Strand; and sold by all Booksellers.

THE

Saturday Magazine.

No. 361. FEBRUARY 17TH, 1838. {PRICE ONE PENNY.

QUEEN ELIZABETH; HER PROGRESSES AND PUBLIC PROCESSIONS.

COSTUME OF QUEEN ELIZABETH WHEN YOUNG.

PART THE THIRD.

EDUCATION OF ELIZABETH—HER LITERARY ATTAINMENTS—HER PORTRAIT.

THE Princess Elizabeth, in common with her brother Edward and her sister Mary, received an excellent education; for this she was much indebted to her step-mother Catherine Parr, the last queen of Henry the Eighth. Her instruction was not confined even to what may be called the ordinary learning of the age; for it embraced the Greek language, which, though rapidly rising into cultivation, had not then become an object of general study. Her first master of the learned languages was William Grindal, a pupil of the eminent Roger Ascham; and in 1548, upon Grindal's death, Ascham himself was called to court to take his place. He had previously been employed in teaching Elizabeth, her brother Edward, and many other illustrious personages, the art "of writing a fair hand," an art in which he had attained great excellence, and in which, excellence was then highly valued on account of its rarity.

We have, from the pen of Ascham, a very interesting account of the course of study through which he led his illustrious pupil, and of the proficiency which she attained in learning; together with some remarks upon her manners and character at that early period of her life. It is contained in a letter which he wrote to a learned friend in the year 1550:

Never (he says), was the nobility of England more lettered than at present. Our illustrious King Edward, in

talent, industry, perseverance, and erudition, surpasses both his own years and the belief of men. ..... Numberless honourable ladies of the present time, surpass the daughters of Sir Thomas More in every kind of learning. But amongst them all, my illustrious mistress, the lady Elizabeth, shines like a star, excelling them more by the splendour of her virtues and her learning than by the glory of her royal birth. In the variety of her commendable qualities I am less perplexed to find matter for the highest panegyric than to circumscribe that panegyric within just bounds. Yet I shall mention nothing respecting her but what has come under my own observation. For two years she pursued the study of Greek and Latin under my tuition; but the foundations of her knowledge in both languages were laid by the dilgent instruction of William Grindal, my late beloved friend, and seven years my pupil at Cambridge.

The lady Elizabeth has completed her sixteenth year; and so much solidity of understanding, such courtesy united with dignity, have never been observed at so early an age. She has the most ardent love of true religion, and of the best kind of literature. The constitution of her mind is exempt from female weakness, and she is endued with a masculine power of application. No apprehension can be quicker than hers, no memory more retentive. French and Latin she speaks like English; Latin with fluency, and judgment; she also spoke Greek with me frequently, and moderately well. Nothing can be more elegant than her handwriting, whether in the Greek or Roman character. In music she is very skilful, but does not greatly delight.

He then gives an account of the different writings which were the object of her study under his tuition.

She read with me almost the whole of Cicero, and a great part of Livy: from these two authors, indeed, her knowledge of the Latin language has been almost exclusively derived. The beginning of the day was always devoted by her to the New Testament in Greek, after which she read select orations of Isocrates and the tragedies of Sophocles, which I judged best adapted to supply her tongue with the purest diction, her mind with the most excellent precepts, and her exalted station with a defence against the utmost power of fortune. For her religious instruction she drew first from the fountains of Scripture, and afterwards from St. Cyprian, the *Common Places* of Melancthon, and similar works which convey pure doctrine in elegant language. In every kind of writing she easily detected any ill-adapted or far-fetched expression. She could not bear those feeble imitators of Erasmus who bind the Latin language in the fetters of miserable proverbs; on the other hand, she approved a style chaste in its propriety and beautiful by perspicuity, and she greatly admired metaphors when not too violent, and antitheses when just and happily opposed. By a diligent attention to these particulars, her ears became so practised and so nice, that there was nothing in Greek, Latin, or English, prose or verse, which, according to its merits or defects, she did not either reject with disgust or receive with the highest delight.

Ascham's employment as tutor to the Princess Elizabeth lasted only two years, at the expiration of which he left her a little abruptly, in consequence of a distaste which he had taken to some persons in her household. "Of this precipitation," says Dr. Johnson, "he long repented; and as those who are not accustomed to disrespect cannot easily forgive it, he probably felt the effects of his imprudence to his death." He was restored, however, before long, to the favour of Elizabeth; and when she ascended the throne, he was appointed to the offices of secretary for the Latin tongue, and likewise tutor to her Majesty in the learned languages. In this latter capacity he was in the habit of constantly reading with her. In his *Scholemaster*, he says,—

After dinner (at Windsor Castle, on the 10th of December, 1566), I went up to read with the Queen's Majesty; we read there together in the Greek tongue, as I well remember that noble oration of Demosthenes against Æschines, for his false dealing in his embassage to Philip of Macedon.

Elizabeth retained a great regard for her tutor to the last; and when she heard of his death she is said to have exclaimed, that "she would rather have thrown ten thousand pounds into the sea than have lost her Ascham,"—an opinion which, considering her economical disposition, must be taken to express a very high estimate of his merits. Of the extent to which she profited by his instructions, and of the proficiency which she long retained in the Latin tongue, a memorable illustration was afforded when the Polish Envoy, whom she received in great state, addressed her in a Latin speech, and poured forth, in his master's name, a string of complaints instead of compliments—which caused the Queen, in her own phrase, to "scour up her old Latin which had so long lain rusting," to rebuke the "malapert orator," an operation which she performed, according to the testimony of persons present, with great effect.

Elizabeth's studious turn of mind, probably contributed much to that peculiar regard which her brother Edward felt for her, and which she reciprocated. "In tastes, feelings, pursuits, and religion," to use the words of Mr. Sharon Turner, "there was that congeniality of mind which most strongly attracts and perpetuates reciprocal affection."

Under Edward the Sixth, (says Sir Robert Naunton,) she was his, and one of the darlings of fortune, for besides the consideration of blood, there was between these two princes, a concurrence and sympathy of their natures and affections, together with the celestial bond (confirmative religion) which made them one; for the king never called her by any other appellation but his sweetest and dearest sister, and was scarce his own man she being absent; which was not so betweene him and the Lady Mary.

Camden tells us that she was in great grace and favour with her brother King Edward, "who called her by no other name than his *Sweet Sister Temperance*,"—as likewise in singular esteem with the nobility and people. "For she was of admirable beauty and well deserving a crown, of a modest gravity, excellent wit, royal soul, happy memory, and indefatigably given to the study of learning."

She wrote frequently to Edward; and though not many years older than himself, "strove to exhibit in her style some of the elaborate but least natural embellishments of literary composition." His affection for her led him to desire her portrait, though with the delicacy of inquiring if he might make the request; and she took some trouble to accompany it with the "artificial flowers of rhetorical diction." Her letter is an interesting specimen of her style:—

Like as the richeman that dayly guthereth riches to riches, and to one bag of money layeth a greate sort til it come to infinit, so methinks your Majestie, not beinge suffised withe many benefits and gentilnes shewed to me afore this time, dothe now increase them in askinge and desiring wher you may bid and commande, requiring a thinge not worthy the desiringe for it selfe, but made worthy for your Higthnes request. My pictur I meane, in wiche if the inward good mynde towarde your grace migth as wel be declared as the outwarde face and countenaunce shal be seen, I wold nor have taried the commandement, but preuent [prevented] it, nor have bine the last to graunt, but the first to offer it. For the face I graunt I might wel blusche to offer, but the mynde I shal never be ashamed to present. For thogth from the grace of the pictur the coulers may fade by time, may give by weather, may be spotted by chance; yet the other nor time with her swift winges shal ouertake, nor the mistie cloudes with ther loweringes may darken, nor chance with her slipery fote may overthrow. Of this althogth yet the profe coulde not be greate because the occasions hath bine but smal, notwithstandinge as a dog hathe a day, so may I perchaunce have time to declare it in dides wher now I do write them but in wordes. And further I shal most humbly beseche your Maiestie that when you shal loke on my pictur you wil witsafe [vouchsafe] to thinke that as you have but the outwarde shadow of the body afore you, so my inward minde wischeth that the body it selfe wer oftner in your presence; howbeit bicause bothe my so beinge I thinke coulde do your Maiestie litel pleasur thogth my selfe great good; and againe bicause I se as yet not the time agreing therunto, I shal lerne to folow this

JOHN W. PARKER, Printer, West Strand, London.

sainge of Orace [Horace] "Feras non culpes quod vitairi non potest," [Bear not blame what cannot be avoided.] And thus I wil (troblinge your Maiestie I fere) ende with my most humble thankes, besechinge God longe to preserve you to his honour, to your comfort, to the realme's profit and to my joy. From Hatfilde this 15 day of May,

Your Maiesties most humbly sistar,

ELIZABETH.

This letter very well illustrates the remark of her tutor Ascham, that she was a great admirer of metaphor and antithesis. Of the few letters which exist, from Elizabeth to her brother, there is another which commences in precisely the same elaborate manner.

Like as a shipman in stormy wether plukes downe the sailes tarijnge for bettar winde, so did I most noble kinge, in my unfortunate chanche a thurday pluk downe the hie sailes of my ioy and comfort, and do trust one day, that as troblesome waves have repulsed me bakwarde, so a gentil winde wil bringe me forwarde to my haven.

After her father's death, Elizabeth resided for some time with her step-mother, the Queen Dowager, who married the Lord Seymour of Sudley, the ambitious and unfortunate brother of the Protector Somerset. The palace of Hatfield was afterwards her residence; and in 1551, Edward granted to her the old abbey of Ashridge, which, at the dissolution of the monasteries, became a royal house. She occasionally visited her brother's court; and Strype records an instance of her riding through London in great state, to the palace of St. James:—

March 17, 1551. The lady Elizabeth, the king's sister, rode through London unto St. James's, the king's palace, with a great company of lords, knights, and gentlemen; and after her a great company of ladies and gentlemen on horseback, about two hundred. On the 19th, she came from St. James's through the park to the court; the way from the park-gate unto the court spread with fine sand. She was attended with a very honourable confluence of noble and worshipful persons of both sexes, and received with much ceremony at the court-gate."

A very curious memorial of the domestic affairs of the Princess Elizabeth, about this time, has been preserved—namely, the Household Book for a year, from the 1st of October, 1551, to the last day of September, 1552. It is entitled "Th' Accumpte of Thomas Parry Esquyer, Couferor [Cofferer,] to the righte excellent Princesse the Ladie Elizabeth, her Grace the King's Majestie's most honorable Sister." Every page is signed at the bottom by the Princess herself.

The sum total of receipts, including the "remayne of the preceding year," amounts to 5791*l.* 1*s.* 3¼*d.*, with the third part of a farthing. The total amount of the payments within the time of the accompt, is 3629*l.* 18*s.* 8¼*d.*; and there was left for the wants of the next year, a "remayne" of 1507*l.* 0*s.* 0½*d.*, a half farthing and the third part of a farthing, which sum is stated to have been delivered into her Grace's own hands upon the determination of this accompt. The expenses of the house amounted to 3938*l.* 18*s.* 7*d.*; but deductions for "hides, felles, and intrails of the cattle," supplied 207*l.* 3*s.* 8½*d.* Under the Buttry and Cellar, great quantities of Beer are entered with "swete wine," "Raynishe wine," and "Gascoigne wine." Board wages for servants are continually mentioned. Lamprey pies are once entered as a present.

The wages of household servants for a quarter of a year, amounted to 82*l.* 17*s.* 8*d.* The "lyveries" of velvet coats for xiij gentlemen, at xl*s.* The lyveries of the yeomen to 78*l.* 18*s.* There is also a sum of 7*l.* 15*s.* 8*d.*, mentioned as "given in almes at sundrie times to poor men and women." Among the entries of the Chamber and Robes are the following:—

Paid to John Spithonius the xvij*th* of Maye, for bokes, and to Mr. Allin for a Bible, xxvij*s.* iiij*d.*

Paid the thurde of November to the kepar of Herforde gayle for fees of John Wingfelde lying in warde, xiij*s.* iiij*d.*

Paid to Edmunde Allin for a Bible xx*s.*

Paid the xiiij*th* of December to Blaunche Parry for her half yeres annuitie, c*s.*, and to Blaunche Qurtnaye for the like, lxvi*s.* viij*d.*

Paid the xiiij*th* of December at the Cristening of Mres. Pendred's childe as by warraunte doth appeare, l*s.*

Paid in reward unto sondrie persons at St. James, her Grace then being there, viz.:—The king's fotemen xl*s.* The under kepar of St. James x*s.* The Gardener v*s.* To one Russel, grome of the Kinge's great chamber x*s.* John Forman x*s.* To the Warderobe xl*s.* The Violans xl*s.* A Frenchman that gave a boke to her Grace x*s.* The kepar of the Parke Gate of St. James x*s.* Mr. Staunfords servants xx*s.* The Lorde Russell's minstralls x*s.* In th' ole, as by warrant appereth, ixli. xv*s.*

Paid in reward to sondrie persons the x*th* of August, viz., to Farmer that plaied on the lute, xxx*s.* To Mr. Ashfelde servant, with ij prise oxen & x muttons, xx*s.* More, the harper, xxx*s.* To him that made her Grace a table of walnut-tree, xliiij*s.* ix*d.* And to M. Cocke's servaunte which brought her Grace sturgeon, vj*s.* viij*d.*

Our engraving contains a portrait of Elizabeth, originally taken from a picture by Holbein, executed in the year 1551, when she was about eighteen years of age. A Venetian ambassador, who was in England a few years afterwards, in the report which, in conformity with the practice of his state, he presented to the Doge and Senate, thus describes her personal appearance:

She is a lady of great elegance, both of body and mind, although her face may rather be called pleasing than beautiful. She is tall and well made; her complexion, fine though rather sallow; her eyes, but above all her hands, which she takes care not to conceal, are of superior beauty.

Camden, as has been seen, describes her in her youth as being of "admirable beauty."

The simplicity of Elizabeth's costume in this portrait, offers a remarkable contrast to that fantastic style of decoration in which she afterwards delighted to display her person. Holbein was remarkably careful in preserving the features of costume, and we have other testimony to his correctness in this instance. "With respect to personal decoration," says her tutor Ascham, in the letter before quoted, "she greatly prefers a simple elegance to show and splendour, so despising the outward adorning of plaiting the hair and wearing of gold, that, in the whole manner of her life, she rather resembles Hippolyta than Phædra." Dr. John Elmer, or Aylmer, who was tutor to Lady Jane Grey and her sisters, and became Bishop of London in Elizabeth's reign, thus speaks of the taste of the princess in this respect when young, in a work entitled,—*A Harbour for faithful Subjects.*

The king left her rich clothes and jewels; and I know it to be true, that, in seven years after her father's death, she never in all that time looked upon that rich attire and precious jewels but once, and that against her will. And that there never came gold or stone upon her head till her sister forced her to lay off her former soberness, and bear her company in her glittering gayness; and then she so wore it as every man might see that her body carried that which her heart misliked. I am sure that her maidenly apparel, which she used in King Edward's time, made the noblemen's daughters and wives to be ashamed to be dressed and painted like peacocks, being more moved with her most virtuous example than with all that ever Peter or Paul wrote touching that matter. Yea, this I know, that a great man's daughter, (Lady Jane Grey,) receiving from Lady Mary, before she was queen, good apparel of tinsel, cloth of gold, and velvet, laid on with parchment-lace of gold, when she saw it said, "what shall I do with it?" "Marry," said a gentlewoman, "wear it." "Nay," quoth she, "that were a shame to follow my Lady Mary against God's word, and leave my Lady Elizabeth, which followeth God's word." And when all the ladies at the coming of the Scots' Queen Dowager, Mary of Guise, (she who visited England in Edward's time,) went with their hair frownsed, curled, and double curled, she altered nothing, but kept her old maidenly shamefacedness.

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY.

No. VIII.

POTTERY AND GLASS MAKING.

THE art of pottery is closely connected with that of brick-making last described, and many allusions are made to the process by the sacred writers. Most of our readers have probably witnessed this interesting operation. A formless lump of clay is placed on a revolving stone; as the wheel turns, a mere touch of the finger suffices to give it shape, the same process hollows the inside and forms the exterior. The simplicity of this plastic process compared with the beauty of the result, suggests a very vivid illustration of the Power which formed man out of the clay; thus Isaiah says, "But now, O Lord, thou art our father; we are the clay, and thou our potter; we all are the work of thy hand." (Isaiah LXIV. 8). The lesson of our dependence on our Creator is also inculcated by a reference to the same imagery. "Woe unto him that striveth with his Maker! Let the potsherd strive with the potsherds of the earth. Shall the clay say to him that fashioneth it, What makest thou? or thy work, He hath no hands?" (Isaiah XLV. 9). A still more remarkable use of this illustration is in Jeremiah, where, under the type of a potter, God shows his absolute power in disposing of nations. "The word which came to Jeremiah from the Lord, saying, Arise, and go down to the potter's house, and there I will cause thee to hear my words. Then I went down to the potter's house, and, behold, he wrought a work on the wheels. And the vessel that he made of clay was marred in the hand of the potter: so he made it again another vessel, as seemed good to the potter to make it. Then the word of the Lord came to me, saying, O house of Israel, cannot I do with you as this potter? saith the Lord. Behold, as the clay is in the potter's hand, so are ye in mine hand, O house of Israel." (Jeremiah xviii. 1—6).

POTTER FORMING THE CLAY.

When the vessels were formed by the potter, they were burned or baked in a kiln. It will be seen from the accompanying engraving, that the fire was kindled at the bottom, and a great heat produced by the draft of hot air through a long and narrow chimney. Several of the vessels were broken in the manufacture, and these, when thrown into a heap, afforded shelter to snakes, reptiles, and disgusting insects, so that the phrase of "being among the potsherds" was frequently used in the East, to signify the lowest degree of degradation. This circumstance may, perhaps, explain a passage, usually regarded as one of the most difficult in the Psalms:—"Though ye have lien among the pots, yet shall ye be as the wings of a dove covered with silver, and her feathers with yellow gold." (Psalms LXVIII. 13).

POTTERY FURNACE.

It only remains to be added, that pottery among the Egyptians was a more honourable employment than brick-making, and was not attended with such fatigue and injury to the constitution. The Egyptian potters were eminent for their artistic skill; their vases * are fully equal to the most beautiful specimens of Greece and Etruria; indeed, there is every reason to believe, that both these nations originally derived the art of pottery from Egypt.

One of the most remarkable inventions of a remote era, was the manufacture of glass, with which the Egyptians were acquainted more than three thousand years ago. Of this we have the clearest possible evidence, not only from numerous specimens of the articles themselves, found in the tombs, and among the ruins of the temples, but also from the painted representations of the processes of manufacture, preserved in the same situations, and from which the illustrations of the whole of this series of papers are copied. They were not only skilled in the art of fusing the materials, but also in the use of the blowpipe, an invention so ingenious that its presence alone indicates a very high degree of civilization. The fusion of glass was closely connected with the art of pottery, for many of the vases and fictile ornaments are glazed over with a vitrefied substance containing the proper proportions of the ingredients for making glass. It was generally believed by the ancients that Egypt produced a peculiar species of earth without which glass of the best quality could not be manufactured; it is not easy to discover the nature of this substance from the loose descriptions transmitted to us, but it is said that the beads and ornaments formed from it possessed all the lustre and brilliancy of the diamond. The specimens of Egyptian beads preserved in the different museums of Europe, show that this description is far from being exaggerated. In some of them colours are blended with more exquisite skill than in any specimens of modern art with which we are acquainted; and in others pieces of coloured glass are made to form beautiful mosaics, an art which is now so rarely practised on account of the great difficulty of finding a proper flux for the glass, that many writers have doubted the possibility of the process.

It is singular that glass beads, both round and oblong, were used by ladies in ornamental work so early as the days of Moses just as they are by modern embroiderers. The oblong beads, or as they are usually called, bugles, were strung into a great variety of fanciful patterns. In the Egyptian collection belonging to the king of the French, there is a lady's reticule formed of bugles, whose workmanship is of extraordinary beauty. The sacred beetle is a conspicuous ornament in the centre, and at the sides there are figures of stags, wrought with a life and spirit which could scarcely be expected from such a mechanical process.

The glass manufacturers were particularly skilful in the art of counterfeiting precious stones. Specimens of these are frequently found in the tombs, and we find that the artists were most successful in imitating the rich green of the emerald, and the brilliant purple of the amethyst. This manufacture of false stones seems to have been practised, not so much for the purposes of deception, as with the design of enabling persons in the middle and lower ranks of life to imitate, at a cheap rate, the luxuries of their superiors. The Jewellers in the following engraving are probably employed in preparing some of these factitious ornaments which were no where so common as in Egypt. Mr. Wilkinson, whose valuable and interesting work on the Domestic Manners of the Ancient Egyptians has been published since these papers were commenced, makes the following remarks on this subject:—

* See *Saturday Magazine*, Vol. VIII., p. 32.

Many false stones, in the form of beads, have been met with in different parts of Egypt, particularly at Thebes; and so far did the Egyptians carry this spirit of imitation, that even small figures, scarabæi, and objects made of ordinary porcelain, were counterfeited, being composed of still cheaper materials. A figure, which was entirely of earthenware, with a glazed exterior, underwent a somewhat more complicated process than when cut out of stone, and simply covered with a vitrefied coating; this last could therefore be sold at a low price: it offered all the brilliancy of the former, and its weight alone betrayed its inferiority; by which means, whatever was novel, or pleasing from its external appearance, was placed within reach of all classes; or, at least, the possessor had the satisfaction of appearing to partake in each fashionable novelty.

Such inventions, and successful endeavours to imitate costly ornaments by humbler materials, not only show the progress of art among the Egyptians, but strongly argue the great advancement they had made in the customs of civilized life; since it is certain, that until society has arrived at a high degree of luxury and refinement, artificial wants of this nature are not created, and the lower classes do not yet feel the desire of imitating their wealthy superiors, in the adoption of objects dependent on taste or accidental caprice.

JEWELLERS MAKING GLASS ORNAMENTS.

Though glass was principally used for fancy works, it was also employed in the manufacture of bottles, vases, and other utensils, but especially wine cups. In the later ages, when the Romans conquered Egypt, the use of glass vases nearly superseded those of gold and silver. Indeed, some of them were so exquisitely wrought, that they were more valuable than if they had been formed of the precious metals.

It is said that Alexander the Great was buried in a glass coffin, and there is no doubt that the Egyptian artists could have produced a vitrefied mass sufficiently large for the purpose. But it is more probable that the coffin, or sarcophagus, was only glazed over; because we find that it was not unusual to have a granite sarcophagus after it had been carved, covered with a coating of vitrefied matter, not very different from that used in the manufacture of our common green bottles. This process displayed the sculptures and hieroglyphics carved upon the granite with great clearness, while it preserved their point and finish safe from the injuries of time.

The porcelain of the Egyptians was a species of glass very similar to that invented in modern times by the celebrated Reaumur, who, almost within our memory, discovered the art of working glass into a substance not very unlike china-ware.

From the great beauty of the Egyptian glass-works, they were esteemed very highly in the remote ages. It is distinctly mentioned by Job, who calls it *Zekukith*, a word which our translators have rendered "crystal," because when their translation was made, the antiquity of glass had not been so decisively proved, as in our times. "The gold and the crystal cannot equal it (wisdom)." (Job xxviii. 17.)

The manufacture of caskets and other such articles of combined ornament and utility was very extensive; these, indeed, were, next to the linens and cottons, the most important exports from the valley of the Nile. Some were enamelled, others very elaborately carved and adorned with studs of metal. The peculiar style of ornamental bordering on some of the caskets, and the spirit of the figures portrayed upon them, could scarcely be paralleled even by the best of our modern artists.

ANCIENT EGYPTIAN CASKET.

Connected with this branch of Egyptian manufactures, we may notice the seal-rings, many of which were made of glass, because the impressions could be carved more easily upon this substance than upon stone. Job speaking of the subjection of the earth to the Almighty, says "it is turned as clay to the seal," whence we find that even before the days of Moses, the process of taking impressions upon some soft substance with a seal was so common that it was used as a familiar illustration in a poem, whose date is probably anterior to the invention of alphabetic writing. The seal was worn as a ring upon the finger, or as the ornament of a bracelet; the former custom prevailed every where before the invention of watches, and is not yet wholly disused. In the Bible we find the seal of a king, or of a witness to an important deed, frequently substituted for the sign manual. Thus in the case of a royal decree, we read in the book of Esther, "Then were the king's scribes called on the thirteenth day of the first month, and there was written according to all that Haman had commanded unto the king's lieutenants, and to the governors that were over every province, and to the rulers of every people of every province according to the writing thereof, and to every people after their language; in the name of king Ahasuerus was it written, and sealed with the king's ring." Esther iii. 12. It will be remembered by most of our readers, that recourse was had in England to the same expedient when the increasing disease of his majesty George IV., rendered it impossible for him to affix his signature to papers of state. The seal in Eastern nations, indeed, is still frequently used as a stamp, being rubbed over with ink and then applied to the necessary document. The use of the seal by subscribing witnesses to bonds or deeds is mentioned by Jeremiah: "Men shall buy fields for money, and subscribe evidences, and seal them, and take witnesses in the land of Benjamin, and in the places about Jerusalem, and in the cities of Judah, and in the cities of the mountains, and in the cities of the valley, and in the cities of the south: for I will cause their captivity to return, saith the Lord." (Jeremiah xxxii. 44). The seal was also used, to detect whether any particular door of a box, safe, or building was opened without the owner's permission, and it was also applied to bags for the same purpose. Thus Job, "my transgression is sealed up in a bag, and thou sewest up mine iniquity." (Job. xiv. 17). It seems also probable that documents were frequently sealed up like modern wills, in order that they should not be opened until after a certain specified time. Thus in the visions of Daniel we read that the "celestial

personage" which was upon the waters of the river said to the prophet, "Go thy way, Daniel: for the words are closed up and sealed, till the time of the end" (Dan. xii. 9.); and Isaiah speaks of an obscure prophecy, as "the words of a book that is sealed." (Isaiah xxix. 11.)

The seal of a king was sometimes, as a mark of special favour, imprinted with ink or some other coloured material on the forehead or face of a person appointed to some especial dignity. Thus we read in the Gospel of St. John "Labour not for the meat which perisheth, but for that meat which endureth unto everlasting life, which the Son of man shall give unto you; *for him hath God the Father sealed.*" (John vi. 27.) To this use of the seal there is a more remarkable allusion in the Book of Revelations: "And I saw another angel ascending from the east, having the seal of the living God: and he cried with a loud voice to the four angels, to whom it was given to hurt the earth and the sea, saying Hurt not the earth, neither the sea, nor the trees, till we have sealed the servants of our God in their foreheads." (Rev vii. 2, 3.)

Amulets, *fetiches*, and other instruments of idolatry, were frequently made of glass or porcelain; and hence, in the second commandment, the prohibition is general, "thou shalt not make unto thyself any graven image," after which comes the special prohibition of images, "nor the likeness of anything that is in heaven above, or in the earth beneath." These small images, which were supposed to act as charms, were great temptations to idolatry, and we find that when Jacob fled secretly from Laban's house, that his favourite wife Rachel stole her father's domestic images, which must have been of small size from the ease with which they were concealed. "Now Rachel had taken the images and put them in the camel's furniture, and sat upon them. And Laban searched all the tent, but found them not." (Gen. xxxi. 34). It was probably to prevent this perversion of the glass manufacture, that the inspired lawgiver of the Hebrews did not make use of glass ornaments in the tabernacle, and that no effort was made to introduce the process into Judea.

TASTE FOR READING.

IF I were to pray for a taste which should stand me in stead under every variety of circumstances, and be a source of happiness and cheerfulness to me through life, and a shield against its ills, however things might go amiss, and the world frown upon me, it would be a taste for reading. I speak of it, of course, only as a worldly advantage, and not in the slightest degree as superseding or derogating from the higher office and surer and stronger panoply of religious principles—but as a taste, an instrument and a mode of pleasurable gratification. Give a man this taste, and the means of gratifying it, and you can hardly fail of making a happy man, unless, indeed, you put into his hands a most perverse selection of books. You place him in contact with the best society in every period of history—with the wisest, the wittiest,—with the tenderest, the bravest, and the purest characters who have adorned humanity. You make him a denizen of all nations—a contemporary of all ages. The world has been created for him. It is hardly possible but the character should take a higher and better tone from the constant habit of associating in thought with a class of thinkers, to say the least of it, above the average of humanity. It is morally impossible but that the manners should take a tinge of good breeding and civilization from having constantly before one's eyes the way in which the best-bred and the best-informed men have talked and conducted themselves in their intercourse with each other. There is a gentle, but perfectly irresistible coercion in a habit of reading well directed, over the whole tenour of a man's character and conduct, which is not the less effectual because it works insensibly, and because it is really the last thing he dreams of. It civilizes the conduct of men, and *suffers* them not to remain barbarous.—SIR JOHN HERSCHEL.

ADVANTAGES OF A TASTE FOR NATURAL HISTORY.

WHEN a young person, who has enjoyed the benefits of a liberal education, instead of leading a life of indolence, dissipation, or vice, employs himself in studying the marks of infinite wisdom and goodness which are manifested in every part of the visible creation, we know not which we ought most to congratulate, the public or the individual.

Self-taught naturalists are often found to make no little progress in knowledge, and to strike out many new lights, by the mere aid of original genius and patient application. But the well-educated youth engages with these pursuits with peculiar advantage. He takes more comprehensive views, is able to consult a greater variety of authors; and, from the early habits of his mind, is more accurate and more methodical in all his investigations. The world at large, therefore, cannot fail to be benefited by his labours; and the value of the enjoyments which at the same time he secures to himself, is beyond all calculation. No tedious, vacant hour ever makes him wish for he knows not what—complain, he knows not why. Never does a restless impatience at having nothing to do, compel him to seek a momentary stimulus to his dormant powers in the tumultuous pleasures of the intoxicating cup, or the agitating suspense of the game of chance. Whether he be at home or abroad, in every different clime, and in every season of the year, universal nature is before him, and invites him to a banquet richly replenished with whatever can invigorate his understanding, or gratify his mental taste. The earth on which he treads, the air in which he moves, the sea along the margin of which he walks, all teem with objects to keep his attention perpetually awake, excite him to healthful activity, and charm him with an ever-varying succession of the beautiful, the wonderful, the useful, and the new. And if, in conformity with the direct tendency of such occupations, he rises from the creature to the Creator, and considers the duties which naturally result from his own situation and rank in this vast system of being, he will derive as much satisfaction from the anticipation of the future, as from the experience of the present, and the re collection of the past.

The mind of the pious naturalist is always cheerful, always animated with the noblest and most benign feelings. Every repeated observation, every unexpected discovery, directs his thoughts to the great Source of all order, and all good; and harmonizes all his faculties with the general voice of nature.

> ..... The men
> Whom nature's works can charm, with God himself
> Hold converse; grow familiar, day by day,
> With His conceptions; act upon His plan,
> And form to His the relish of their souls.
>
> WOOD.

ON A PEACEABLE TEMPER AND CARRIAGE.

WE are obliged to these duties of humanity, upon account of common interest, benefit, and advantage. The welfare and safety, the honour and reputation, the pleasure and quiet of our lives are concerned, in our loving correspond ence with all men.

FOR so uncertain is our condition, so obnoxious are we to manifold necessities, that there is no man, whose good will we may not need, whose good word may not stand us stead, whose helpful endeavour may not sometimes oblige us.

The great Pompey, the glorious triumpher over nations, and admired darling of fortune, was beholden at last to a slave for the composing his ashes, and celebrating his funeral obsequies. The honour of the greatest men depends on the estimation of the least, and the good will of the meanest peasant is a brighter ornament to the fortune, a greater accession to the grandeur of a prince, than the most radiant gem in his royal diadem.

It is but reasonable, therefore, if we desire to live securely, comfortably, and quietly, that by all honest means we should endeavour to purchase the good will of all men, and provoke no man's enmity needlessly; since any man's love may be useful, and every man's hatred is dangerous. —ISAAC BARROW.

LIFE'S evening, we may rest assured, will take its character from the day which has preceded it; and if we would close our career in the comfort of religious hope, we must prepare for it by early and continuous religious habit.—SHUTTLEWORTH.

ON WRITING MATERIALS.

No. II. The History of Steel Pens.

The first attempt at the construction of Permanent Pens, appears to have consisted in arming the nibs of Turkey-quill pens with metallic points or nibs. As the friction of the quill pen upon the paper, and the softening produced by the ink, are the causes which wear away the nibs of ordinary pens, it is obvious that metal is better calculated to withstand these two influences than quill. But although the metallic nibs greatly increased the durability of the pen, it was at the expense of the elasticity of the quill; and since the durability of the metallic-nibbed pen was not adequate to its additional cost over the common quill pen, this method was soon abandoned.

In our "History of the Quill Pen," we have given a mode of cutting up the quill in the direction of its length, (as practised by Mr. Bramah,) whereby a great many pens could be formed out of one barrel. The object of this process was to prevent pen-mending, an operation which most writers feel to be an infliction.

Pens have been made, from time to time, out of horn and tortoise and other shells. These pens were of course more expensive than common quills, and nearly all of them more durable. Nibs have even been formed, somewhat successfully, of precious stones, the advantage of which is, that they are subject to no wear and corrosion. In 1823 Messrs. Hawkins and Mordan employed horn and tortoise-shell, which were cut into nibs, and softened in boiling water; small pieces of diamond, ruby, and other precious stones were then embedded into them by pressure. In this way were insured durability and great elasticity. In order to give stability to the nib, thin pieces of gold, or other metal, were affixed to the tortoise-shell. Pens somewhat similar were formed by Mr. Doughty; his nibs were rubies set in fine gold. With these pens a person could write as finely as with a crow-quill, or as firmly as with a swan-quill, or the two modes might be combined. These pens possessed considerable elasticity, and by their means an uniform manuscript, unattainable by means of ordinary pens, could be produced. Pens of this construction have been in constant use for upwards of six years, and at the end of that time exhibited no signs of wear, they were as perfect then as ever. In using them, however, care is necessary to preserve the nibs from contact with hard bodies; they require occasional washing with a brush in soap and water. Mr. Doughty states that, although they are costly at first, yet, in the end, they will be found economic, on account of their permanency. To prevent injury to the points, in the act of dipping this pen into an ink-stand, Mr. Doughty lines the interior of his elegant ink-stands with India-rubber, or places a bottle of that material within the stand to contain the ink.

Dr. Wollaston also constructed pens from two flat slips of gold, placed angularly side by side, and which were tipped with the metal rhodium; others have employed the metal iridium; but these pens have been abandoned on account of their expense, and the great care necessary to their preservation. These pens were, however, very durable, though not equal to the ruby nibs.

Many of the pens to which we have alluded, were sadly deficient in that indispensable quality, elasticity. To supply a remedy to this defect, it was proposed to place springs on the backs of such pens, sliding backwards and forwards, to vary the elasticity according to the different hands required in writing. This plan was somewhat successful, but a great objection was, that the ink drying upon the pen, in a great measure neutralized the action of the spring.

Metallic pens appear to have been introduced into various seminaries, from time to time as rarities, among writing materials; they were given as prizes, rewards for merit, &c. But the first mention that we find of *steel pens* for writing, is in 1803, when Mr. Wise constructed barrel-pens of steel, mounted in a bone case for convenience of carrying in the pocket. These pens were very dear, and produced to their inventor but a scanty income. For many years, however, Wise's pens were the only steel pens that could be had, and by means of great activity in "pushing a sale" of them, they were to be had at almost every stationer's shop in the kingdom.

About twelve years ago, the celebrated Perryan pens first appeared. Mr. Perry may be regarded in the light of a great improver; many of his pens are ingenious and original in construction. He arranges his pens into genera and species, advertises their beauties and their merits in prose and rhyme, and has thus, not altogether undeservedly, acquired fame and renown, and, we doubt not, profit, to which, years ago, a mere pen-maker would not have aspired. Mr. Perry first overcame the rigidity complained of in steel pens generally, by introducing apertures between the shoulder and the point of the pen; thus transferring the elasticity of the pen to a position below instead of above the shoulder. This was the object of his patent of 1830. In 1832 further improvements suggested to him the propriety of seeking a second patent, which he obtained for a pen now bearing the odd cognomen of "The Double Patent Perryan Pen." Perry's "Regulating Spring Pen" is furnished with a sliding spring, which increases or diminishes its flexibility, according as it is placed farther from or nearer to the point. In another case, Mr. Perry employs a thread of India-rubber round the nibs of his pens, the yielding of which allows the points to open in proportion to the pressure.

One of the most extensive manufacturers of steel pens is Mr. Joseph Gillott, of Birmingham. This gentleman employs three hundred pairs of hands, and consumes fifty tons of steel annually. Now one ton of steel is sufficient to make about two millions of pens; hence this manufacturer alone furnishes about one hundred millions of pens annually.

The kind of pen made by Mr. Gillott is similar to the original pen by Wise. The improvement of the modern maker consists in employing metal of a better quality, and in a thinner and more elastic state; in making the slit shorter, and in carefully attending to the finish and temper of the metal. These improvements have been attended with such a reduction in price, that a gross is now sold for very little more than was formerly charged for one of Wise's pens.

The common "Three-slit Pen" has long been, and still is, a favourite with steel pen writers. Its peculiarity consists in having a slit on each side of the central slit, the elasticity being thereby much increased.

The nibs of all pens increase in breadth by use, so that steel, as well as quill pens, require mending, or rejecting for a new one. The difference is a question of time, for while a quill pen will increase in breadth in an hour, the steel pen may be used for many days without the necessity of mending or rejection. But steel pens may be mended by means of a fine file or an oil-stone, by which the nibs can be brought to points sufficiently acute for the purposes of the writer; but the present low price of steel pens renders it very questionable, whether the time employed in mending them would not be thrown away.

Mr. Gillott has taken out a patent for an improved

pen, the object of which is to remedy the defect complained of, that the nibs increase in breadth by use. In the new pen, the nibs are made parallel-sided for about one-eighth of an inch long, the remaining portion being cut in the usual curved manner, so that one-eighth of an inch may be worn away without increasing the breadth of the nibs. We have not used any of these pens, but it occurs to us, that by the above means the equable opening and closing of the nib during writing cannot be insured, that the ink would not flow down in sufficient quantity, and that unless the pen were held in one particular direction, the equal wearing away of the nibs would not occur. We should rather fear that the pen would often act the part of a chisel, and dig into the paper instead of moving over its surface; but these objections are offered without ever having used the pen which suggests them.

The oblique position in which the pen is held induced Messrs. Mordan and Brockeden, in 1831, to make their *oblique* pens, in order that the two sides of the nib should bear equally on the paper. The form of this pen is that of a bird's head and bill; the slit, or mouth of the bird, is the part employed in writing, and this slit is inclined, at an angle of 35°, to the general direction of the pen. They hold a great deal of ink, and their use is pleasant to the writer.

Other pens, called *Lunar* Pens, have been adopted. Their under surface being large and concave, a great portion of ink is taken up by them, and thus the writer's time is economized.

Mr. Gowland has invented a pen with an additional nib, called the "Three-nibbed Slit Pen." The additional nib is formed by cutting it out of the shank, and turning it back over the nibs. This pen is manufactured by Mordan, as also "Mordan's Counter-oblique Pen." Both these pens hold much ink, and the awkward appearance of obliquity in the bird's-head pen is removed, while, at the same time, the oblique effects are preserved.

There are many other forms of steel pens, which we need not stop to describe, since the examples already given will afford to the reader a sufficiently accurate idea of their forms and uses. We proceed, therefore, to perhaps the most interesting portion of this article, viz., the processes by which steel pens are manufactured.

The steel with which the pens are made is rolled into very thin plates; it is then cut into slips, about four inches broad and three feet long, then annealed for fourteen hours, and again submitted to the roller; the thickness of these bands is not more than $\frac{1}{10}$th of an inch. The bands are then passed under a stamping-press, and pieces of the proper size for the pens are cut out with great rapidity. These pieces are called *blanks*, or *flats*, and are so cut out, that the fibres of the steel shall run in the direction of the length of the pen. The blanks are now submitted to the action of a hardened steel punch and matrix, of the exact size and shape of the pen, and which are attached to a powerful fly-press. The pens are then softened by being put into an iron box containing tallow; this box is placed in a furnace and equally heated. When the box is withdrawn, the pens are emptied upon hot ashes and covered with the same, and so allowed to cool gradually; by this means they are sufficiently soft for the subsequent processes. They are then marked for the slits; this is done by means of an extremely fine-edged chisel, brought down separately upon each pen, and so admirably adjusted that two-thirds only of the substance of the pen is cut through. The edge of this chisel is finer than any razor, but much harder, because it will perform its office for a whole day without renewing its edge; this superior quality is given to the steel by hammering it for several hours. This is an important fact, and seems to have been discovered by the pen-makers. When the other slits and openings have been made, and the maker's name stamped, the next operation is called *dishing*, by which the proper shape is given to the pens by means of a metallic punch and die, accurately fitting each other, the two being the exact form of the pen.

The pens are now hardened by being heated to redness, and being then plunged into cold oil, which must be at least three feet deep. The oil in a few weeks loses its properties and becomes charred. The next operation is cleaning and polishing; this is effected by a very curious machine. It consists of a tin cylinder, eight or nine inches in diameter, and three feet long, with a hole in the middle of its length, for putting in and taking out the pens, which hole is covered by a lid. This cylinder is hung on joints at each end to cranks, formed one on each of two axles furnished with a fly-wheel, and one of them with a handle. As this latter is turned, the cylinder is thrown up and down and backwards and forwards, and the pens are agitated in a manner similar to materials shaken in a bag. This motion is continued for eight hours, when many thousands of pens, by rubbing against each other, are found to be entirely deprived of any roughness which might have otherwise existed on them, and which, though invisible to the eye, might offer serious impediments to free writing. They are now tempered by being placed on a furnace-plate, and as soon as they have acquired a bright blue colour they are removed; this colour indicates the best temper for the pens, and is due to a thin film of oxide formed on the surface; were they heated in vacuo, or in any medium containing no oxygen, the blue colour would not appear. The last operation consists in cracking the slits, which is done by pressing the nibs suddenly with a pair of pincers; the slit, which was cut only two-thirds through, then suddenly opens.

It is calculated that the total quantity of steel employed in this manufacture, amounts to 120 tons per annum, from which upwards of 200,000,000 of pens are produced.

There is, however, a considerable waste of material in this branch of art. The pieces of steel cut out of the pens cannot be applied to any use; it is so thin that it cannot be welded, and it cannot be melted, because it takes fire and burns, in consequence of access of air between the thin pieces.

It is a cheering statement, that in spite of the immense consumption of steel pens, the demand for quills has not abated, but, on the contrary, is on the increase. This is to be accounted for by considering that, within the last few years, population has greatly increased, and that by the diffusion of the refining influence of education, that class of persons now can write which twenty years ago was altogether illiterate. Besides this, the Continent and America are supplied by us with steel pens. When first introduced, they were as high as 8*s.* per gross, then they fell to 4*s.*, and now they are manufactured at Birmingham at so low a price as *four-pence* per gross! As yet, it appears that the only branch of trade that has suffered by the introduction of steel pens is the cutlery trade: pen-knives are in less requisition than formerly.

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THE STORY OF

MASANIELLO, THE FISHERMAN, AND THE REVOLUTION OF NAPLES.

CHILDREN OF THE NEAPOLITAN LAZZARONI.

PART THE SECOND.

JULY 8th.—The morning of Monday had scarcely dawned, when licentious bodies of rioters appeared parading the streets, renewing the scenes of the former day with tenfold violence. In this, as in every other instance of a popular outbreak, it was found that the disposition to riot, like every other evil principle, is greatly strengthened by indulgence, and that the calamities of licentiousness accumulate with frightful rapidity. The Duke of Arcos resolved to negotiate, and he employed a Neapolitan nobleman, the Duke of Matalone, whom he held at the time as a prisoner in the castle, to act as his mediator with the insurgents.

No more puzzling question could be put to the Neapolitans, than to ask what was the substance of their demands. The expectations of a mob are always vague, and hence they insist upon impossibilities. The leaders of the insurrection demanded not only the abolition of all imposts, but the production of a charter, written, as they said, in letters of gold, and granted by the Emperor Charles the Fifth, to the citizens of Naples. No such document had ever existed, but nothing short of a miracle could convince the multitude of their delusion. Masaniello averred that it had been supernaturally described to him, and this declaration rendered further evidence superfluous.

The viceroy under these circumstances endeavoured to palm on the populace a forged document similar to that which they required. There had not been sufficient time to give such a fraud even a chance of success; it was at once detected, and popular indignation was directed against the Duke of Matalone. The fiercer insurgents seized on his person, loaded him with chains, and dragged him to prison.

Masaniello's malady had been aggravated by a sleepless night; he incited his followers to fresh acts of violence, and begun to display a fierce hatred of the nobility and gentry. With his sanction, the houses of all who were regarded as enemies to the people, were gutted and destroyed; his followers, the lowest and most licentious of the Lazzaroni, paraded the streets with boat-hooks to drag the gentlemen from their horses, and inspired such terror, that the appearance of one of them was sufficient to clear a crowded street. The very women joined in these excesses, with muskets on their shoulders, swords by their sides, and daggers in the folds of their dress; and even the children were made to bear their part in the national frenzy. A second night of revolution closed in, and the results of the

tyranny of a mob were traced in characters of blood and flame on the once lovely city of Naples.

July 9th.—The excesses of the former days were renewed with fresh violence. Masaniello led a body of his followers against the steeple and church of St. Lorenzo, which had been garrisoned by a company of Spanish soldiers, who were too few to offer any effective resistance. Henceforth, the church of St. Lorenzo became the chief focus of the insurrection, and its great bell was used to sound the tocsin, whenever Masaniello and his successors deemed it necessary to summon an assembly of the people. In the evening of the day, the viceroy made a new effort to open a negotiation with the insurgents, employing as his ambassador Cardinal Felomarino, Archbishop of Naples, who was rather a favourite with the populace. He persuaded the people and their leaders that he had full power to arrange all the points of difference, and he produced copies of the charters granted by Ferdinand the Catholic, and Charles the Fifth. Though these documents contained nothing like the stipulations ignorantly expected by the multitude, they were received with satisfaction, and the night was passed more peacefully than either of the preceding.

July 10th.—The expectations of peace to which the cardinal's embassy had given rise, were disappointed by a new series of events. Large parties of banditti, which had long infested the kingdom of Naples, flocked to the capital, and were gladly received by Masaniello. To one of these criminals, by name Perrone, he intrusted the charge of the prisoners. But the Duke of Matalone found little difficulty in persuading the bandit to become a traitor to the popular cause, and to join with another bandit, named Palombe, in a plot for the assassination of Masaniello. As a preliminary, the duke was permitted to make his escape, and he took good care to remove himself to a safe distance.

Masaniello summoned a general assembly, to deliberate on the proposals made by the cardinal; an immense multitude thronged into the square appointed for the meeting; but the appearance of five hundred banditti, armed to the teeth, well mounted, and acting in concert, excited some alarm. They rode forward to the place where Masaniello stood; some exclamations from the crowd excited his alarm, and he commanded the bandits to dismount. Instead of obeying the order, seven of them discharged their carbines at him, but though his shirt was burned by the gunpowder, not a ball struck him. The enraged mob immediately assailed the bandits; thirty of them fell at the very first discharge, and the rest sought shelter in a church, trusting that the Neapolitans, who are proverbial for superstition, would respect the sanctuary.

But in the terrible excitement of popular fury, religion ceases to curb violence, and superstition is of course still more inefficacious. The enraged multitudes forced the gates, the work of butchery went on in the sacred precincts, the floor was flooded with blood, wretches were slaughtered while they grasped the altar, and the images of the Virgin and the Saints were stained with the gore of the victims. A few were reserved for a worse fate; they were tortured to force a confession; cords were drawn round their thumbs, and tightened until blood spouted from the nails; the heads of others were subjected to similar compression until their eyes were starting from the sockets: they confessed the plot that had been laid for the murder of Masaniello, and the intention of their masters to fall upon the mob during the confusion that must necessarily result from the loss of the popular leader. All agreed that the Duke of Matalone and his brother, Don Joseph Caraffa, were the contrivers of the conspiracy; but some, probably in the vain hope of preserving their lives, added many other horrors, declaring that a plot had been laid for undermining the place of assembly, and blowing all the insurgents together into the air. These revelations scarcely delayed their fate, as each told all he was supposed to know, he was hewn down, beheaded, and mutilated in barbarous triumph.

The assembly still continued its meeting; Masaniello, guarded by the most ferocious of the Lazzaroni, bearing on pikes the gory heads of the slain banditti, harangued the multitude, exaggerating the dangers from which he and they had escaped, and calling for vengeance on the whole body of the nobles.

Horrid outcries rent the air as he concluded; a party instantly departed in search of the duke and his brother, while others, in anticipation of their capture, hastily prepared a wooden scaffold; the bleeding bodies of those who had been slain were tied to the tails of horses and dragged through the streets; the fishermen, the Lazzaroni, and hordes of degraded women, incensed by fury, mutilated the senseless carcasses, while children wallowed in the blood, and seemed to take a premature delight in slaughter. Matalone escaped his pursuers, but Caraffa was taken and dragged towards the square. His captors could not delay their eagerness for his blood, and, before he reached the scaffold, a butcher struck off his head with a blow of a cleaver. When intelligence of this event reached Masaniello, he ascended the scaffold, still in his sailor's dress, with a drawn sword in his hand, and exclaimed, "Bring here the head of the traitor." His orders were obeyed, and the furious demagogue insulted and spurned the corpse of the unfortunate nobleman, until his own followers could not conceal their feelings of disgust.

During this dreadful day the Neapolitan clergy kept the churches open, covered the altars with the ornaments used in the services for the dead, offered up prayers for peace, and repeated the service of their church called "supplications for the passing soul," usually recited for persons at the point of death. Even this spectacle failed to produce the intended effect; murderers with their weapons of slaughter, incendiaries waving their blazing torces, stopped at the gates of the churches as they passed, uncovered their heads, knelt for a few moments to go through the mummery of devotion, and then went on their way to continue the work of destruction.

July 11th.—The Duke of Arcos was far from breaking off the negotiations in consequence of the preceding horrors. Cardinal Felomarino again presented himself as a mediator; Masaniello, who was unable to write, dictated to his secretaries certain conditions for peace, principally insisting on the total abolition of taxes, and full indemnity for all who had engaged in the insurrection. When the articles were prepared, they were read to the people in the church of the Carmelites, and received with loud acclamation. Cardinal Felomarino then proposed that Masaniello should accompany him to the Spanish governor; the proposition was adopted, and the demagogue exchanged his sailor's dress for a superb robe of silver tissue. He then mounted a splendid charger, richly caprisoned, and, accompanied by a vast multitude, proceeded to the viceroy.

The Duke of Arcos, though imbued with a double portion of Spanish pride, received the imperious fisherman with the utmost respect, and treated him as if he had been the first of the grandees. The courtly ceremonies were tedious; they were pro-

JOHN W. PARKER, Printer, West Strand.

tracted to such a length, that the crowd which waited outside for Masaniello's return, began to get alarmed, and to show symptoms of suspicion and uneasiness. On hearing this Masaniello stepped to the window, and by a single word hushed the miscreants to silence. He took the opportunity of showing to the viceroy the wonderful and perilous influence which he had established over the populace by manifesting their immediate and implicit obedience to his commands. He gave a signal with his hand, and instantly all the bells in the city began to toll; he waved his hand once more, and their knell instantly ceased. He lifted his arm, and the multitude raised deafening shouts; he placed his finger on his lips, and the assembled thousands became mute and motionless as statues. Such an exhibition produced the designed effect; the viceroy felt it necessary to recognise the title of so potent a demagogue; he not only saluted him as captain-general of the populace, but placed a gold chain round his neck with his own hands, and proclaimed him Duke of St. George.

July 12th.—The hopes of peace were baffled by the increasing malady of Masaniello; he was haunted by a morbid terror of death, dreading particularly the banditti, and the nobles by whom he believed them to be instigated. He could only sleep for a few minutes at a time, keeping his attendants in constant excitement, by springing from his troubled slumbers and exclaiming, "Up, up, there can be no rest for us until we are masters of Naples!" He received food only from the hands of one of his relations, and he frequently expressed a belief that he would eventually be deserted by the fickle populace, ignominiously slain, and that his body would be exposed to insults as gross as those which had been offered to the remains of Caraffa. Agitated by these apprehensions, he no longer received applications and petitions in the market-place, but posted himself at the window of his own cottage, in his fisherman's dress, with a loaded blunderbuss at hand. A body of the Lazzaroni surrounded the house as guards and executioners of his will; two secretaries prepared his answers, sentences, &c., and in all of these Masaniello continued to manifest an implacable hatred of the aristocracy.

July 13th.—The business of this day was the installation of Masaniello in the cathedral, and the solemn ratification of the articles of peace arranged between him and the viceroy. During the ceremony the marks of Masaniello's madness first became obvious to the spectators; he frequently interrupted the reading of the articles by captious and even absurd objections; at the conclusion of the ceremony he was with difficulty restrained from throwing off his robes, and assuming his old dress in the presence of the whole assembly. The multitude, however, still adhered to him, and their acclamations succeeded for a time in restoring his equanimity.

July 14th.—The insurrection had now lasted a week; a second Sunday had dawned, and the distractions of Naples seemed to have become worse than ever. Masaniello's insanity now began to be manifest to the multitude; he galloped through the streets half-naked, invited the cardinal and the Duke of Arcos to sup with him, jumped into the sea with his clothes on, continued to swim about for an hour, and drank at supper twelve flasks of strong wine. The intoxication which ensued, produced the only sound sleep he had enjoyed since his elevation.

July 15th.—Insurrectionary violence was now beginning to grow weary of its own excesses. The populace had nothing to do; for all who could be regarded as enemies of the public cause were removed. Masaniello's insane freaks, sometimes ludicrous and always mischievous, tended greatly to abate the popular enthusiasm in his favour; a new conspiracy was formed for his destruction, in which many who had been his most ardent supporters were included. His despotic power, which he frequently manifested by various acts of tyranny during the day, seemed still too formidable to be resisted. But towards evening he drew his sword, cut furiously at all around him, and became so outrageous that his friends were obliged to bind and secure him during the night.

July 16th.—Early in the day Masaniello escaped from the friends who detained him in custody, and rushed into the church of Del Carmine, during service before a crowded congregation. When the solemnity was concluded, Masaniello ascended the pulpit with a crucifix in his hand, harangued them in a desponding mood, complaining that he was betrayed and deserted. As he grew warm with the fervour of discourse, his insanity began to break out; at length his language and his gestures became so outrageous that the priests removed him by force from the pulpit. He then applied to the cardinal for protection, offering to resign all his authority to the viceroy, and the prelate persuaded him to retire into an adjoining cloister. The conspirators soon burst into his place of refuge, exclaiming, "Health to the king of Spain and death to Masaniello!" For a moment his former energies were rallied; he turned round to the assassins, and in a tone of firmness exclaimed, "Do my faithful subjects seek me? Here I am." The words had scarcely passed his lips when he received the fire of four muskets in his bosom; he had only time to exclaim, "Ungrateful traitors!" as he fell. He was a dead man ere his head touched the earth.

The crowded congregation, in the church of Del Carmine, learned the fate of the popular favourite without emotion. Those who had followed shouting in his train on the preceding day, patiently stood by while his head was cut off to be borne as a trophy to the viceroy. His body was dragged through the streets by a rabble of boys, among whom the nobility freely flung pieces of money, and was then cast into one of the city ditches.

July 17th.—The death of Masaniello does not conclude his "strange eventful history." On the morning after his murder a vast crowd of the Lazzaroni assembled, sought out his dishonoured remains, and carried them in melancholy procession to the cathedral; there his body was arrayed in royal robes, decorated with a crown and sceptre, and treated with all the respect due to a deceased sovereign. His funeral was celebrated with the utmost pomp; thousands of armed men followed the hearse, testifying their respect and sorrow; as the body sunk into the grave the assembled multitude burst into a passion of tears, prayers, and lamentation, and the memory of the unfortunate fisherman was long held in the highest veneration by the mob of Naples.

Thus, in the short space of ten days, Masaniello was raised from indigence and obscurity to the height of power; then suddenly slain as a wild beast and dragged through the city with ignominy, yet finally buried as a prince and almost worshipped as a saint.

The civil war soon broke out afresh, but the Neapolitans, after their first enthusiasm had cooled, proved unable to resist the might of the Spanish monarchy. Torn in sunder by internal tumults, insulted by their leaders, betrayed by their favourites, and plundered by banditti, they were glad to purchase peace upon any terms, and to submit to a government still more oppressive than that against which they had taken up arms.

HISTORY OF THE OLIVE TREE, AND THE MODE OF PREPARING THE OIL.

No. II

THE *cultivation* of the Olive has always been particularly attended to by the husbandmen of Western Asia and Southern Europe. It was formerly, and at the present day, propagated both by cuttings and by grafts; the latter method is referred to at some length in Romans xi. 17—24.

There was a law at Athens that the Olive-tree must be planted nine feet from another man's ground, because it is said to spread its roots further than other trees.

Virgil, describing the various ways which Nature has ordained for the propagation of trees, says, that Olives are increased by truncheons, that is, by cutting or sawing the trunk or thick branches into pieces of a foot or a foot and a half in length and planting them; whence a root, and soon after a tree, was formed. He goes on to express his astonishment at their great vitality:—

> E'en stumps of Olives, barred of leaves and *dead*,
> Revive, and oft redeem their withered head.

In another place, he says, that these trees,

Unlike vines, when once they have taken root and braved the winds, require neither pruning-hooks nor rakes; the land itself, after being ploughed, affords sufficient nourishment, and so productive are the plants that it would almost seem as if the fruit in full maturity were really turned up by the ploughshare.—*Georgics*, II. 420.

But little alteration has taken place in its culture. It is still propagated by grafts, or by suckers and truncheons, and it is still the custom to deposit stones in the trenches for encouraging moisture about the roots, as described by Virgil.

Its successful cultivation may be taken as no uncertain test of the industry and security of the country that produces it; its delicate constitution, if the term may be allowed, and the long period that must elapse before it will bear fruit, demands all the care and patience of the labourer. If once the original stock is destroyed, as frequently happens during a war, a whole generation must pass away before the new plants come to maturity, and unless property is protected and the labourers have some interest in the soil, it may not be reproduced for centuries. Under the paternal government of Greece it is daily adding to the riches of the country, while in Egypt it has gradually disappeared, nor have they been able to revive its cultivation. "Of many thousand young Olive-trees," says Prince Puckler Muscau, in a recent letter to this country, "which Ibrahim Pasha caused to be distributed gratis some years ago, hardly one remains, because they were carelessly planted and still more carelessly looked after."

The Olive, in the Western world, (says Gibbon,) followed the progress of peace, of which it was considered as the symbol. Two centuries after the foundation of Rome, both Italy and Africa were strangers to that useful plant; it was naturalized in those countries, and at length arrived into the heart of Spain and Gaul. The timid errors of the ancients, that it required a certain degree of heat, and could only flourish in the neighbourhood of the sea, were insensibly exploded by industry and experience.

The Olive grows readily in our own country by cuttings, or it may be grafted on the privet.

With protection during frost, (says Mr. Loudon,) it may be maintained against a wall in the latitude of London. Some trees so treated produced a crop in the garden of Camden House, Kensington, in 1719, and in Devonshire some trees have stood the Winter for many years, as standards, though without ripening their fruit. Large plants are frequently imported from Genoa along with orange and pomegranate trees.

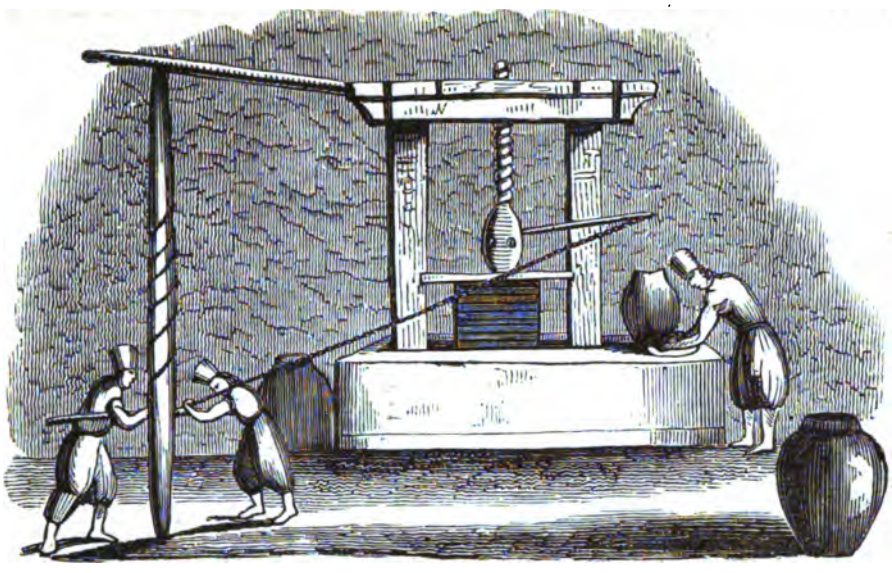
This subject affords an opportunity of saying a few words upon the mutual action and reaction of vegetable upon animal, and of animate upon inanimate matter. By tracing the food of animals through all its conditions, we find that no substance or being is isolated or self-dependent—that the same element is gradually developed from inert matter to vegetable life—from vegetable to animal life—and that its apparent death is merely its transition from one condition to another. It was observed by a native of Marseilles that the Olive, in its wild state, is propagated by kernels that have undergone the digestive process of animals, and more particularly of birds. It was further observed that, by this process, the fruit was deprived of its natural oil, and thus rendered permeable to the moisture of the soil, the excrement of the animal at the same time serving for manure, and probably the soda which that contains, by combining with the portion of the oil that has escaped digestion still further ensuring germination; the continuance of the species being thus produced by the very means that would seem to have destroyed it. The digestive process is so powerful, that, "some physiologists," says John Hunter, "will have it, that the stomach is a mill—others, that it is a fermenting vat—others again, that it is a stew-pan—but in my view of the matter, it is neither a mill, a fermenting vat, nor a stew-pan—but a stomach;" its action, however, is so powerful, that the handles of knives swallowed by jugglers have been dissolved, and the edges of the blades been acted upon by the gastric juice; yet the principle of life in the kernels of the Olive is still more powerful, resisting all chemical action except that which is favourable to germination *.

Olive oil was, perhaps, the first, certainly the *chief object of the early commerce of the Levant*. As vast quantities of it were made by the ancient Jews, it became an article of exportation. The demand for it in Egypt led the Jews to send it thither, and the prophet Hosea, xii. 1, upbraids his degenerate nation with the folly of their conduct, when, in the decline of their national glory, they carried the produce of their Olive-plantations into Egypt as a tribute to their ancient oppressors, or as a present to conciliate their favour, and obtain their assistance in the sanguinary wars which they were compelled to wage with the neighbouring states.

It was also carried into Egypt by the Greeks; Plutarch tells us that Plato defrayed the charges of his travels by selling oil in Egypt.

The relative value of this tree, as compared with other productions of the soil, may be seen by the oath which the Athenian youths were required to take at the age of eighteen. "My endeavours to extend the dominions of Athens shall never cease while there are wheat, barley, vineyards, and olive-trees

* One more instance of the reaction that animals exert upon vegetable life. The formation of the finer soils immediately upon the surface of lands is chiefly to be attributed to the digestive process of the common earth worm. Swallowing with its food a considerable quantity of earth below the ground, it deposits this upon the surface in a state admirably adapted for vegetation. This little gardener "earths up" the delicate roots of plants from which the mould has been washed away by rains, and is continually preparing a fresh soil to receive their seeds. It has been lately proved by actual observation, that the superficial stratum of a field is entirely changed in this manner every few months, and that pieces of pottery that have been thrown away as rubbish, are buried, in the course of a few years, to the depth of several inches. There is no room left to adduce other examples, but it requires no painful labour to follow nature ourselves through this or any of her paths: it is true that we have no opportunity in this country of observing whole reefs of rocks, secreted by one class of animals as bone is secreted in the human body. (see *Saturday Magazine*, Vol. III., p. 219,) and the surface of these rocks broken down into a rich and impalpable mud by another class, both lower in the scale of creation than the common earth worm. But there are changes going on before the eyes of all, so beautiful and yet so simple, that it seems strange that our attention is not more frequently arrested by them—and seeing them, that our minds can remain insensible to the perfect wisdom they evince.



THE OLIVE PRESS.

without its limits." At Athens there was a separate market called the "oil market," and a small trade was carried on in the fruit itself, for, according to a law in force, "all olives are exportable, but other fruits are not; so that the archon shall openly curse the persons that exported them, or else be fined 100 drachmas," (*3l. 4s. 7d.*)

The oil and unripe fruit in a pickled state are chiefly brought to England from Languedoc, Leghorn, and Naples; the best oil is from Leghorn, and the best pickles from Genoa and Marseilles. The Ionian islands are very rich in oil. The average product of the harvest of Zante is from 4400 to 4500 barrels, and that of Corfu in 1835 was reckoned at 80,000 or 100,000 barrels, and was valued at 2,000,000 dollars; but it must be observed that the trees bear well only every second year, and 1835 was the productive year.

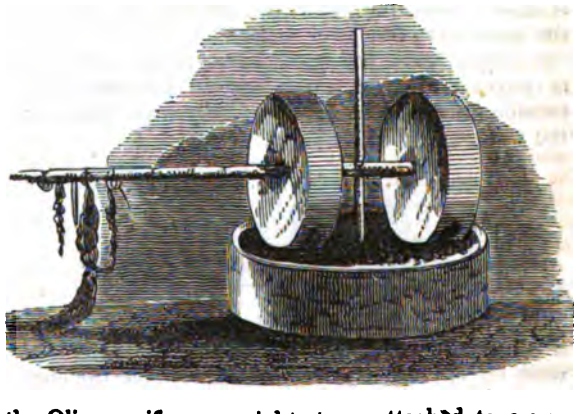
Strangers visiting the Ionian islands in Autumn are apt to think that currants are the chief produce, as at that time the whole of the country is engaged in the currant harvest, and the ports are crowded with vessels anxious to obtain the first fresh fruit. The trade in oil, however, is the most valuable, but as it is carried on constantly, and the oil is quietly embarked all the year round, it does not come so directly under the notice of strangers.

The process of expressing the oil is very interesting. Before the invention of mills it was obtained by pounding the fruit in a mortar; in Exodus xxvii. 20, we read of "pure olive-oil beaten for the light." It was also obtained by treading them with the feet in the same way as they crush grapes in many places at the present day, as at Xeres in Spain for our sherry wine; so in Micah vi. 15, "Thou shalt tread the olives;" but the feet appear to have been armed with metallic shoes; "Let him dip his foot in oil; thy shoes shall be iron and brass."—Deut. xxxiii. 24, 25.

To illustrate the preparation of oil, as it is carried on at the present day, we shall conclude with a description of some Olive-mills at Athens.

About half a mile from Athens, on the road to the port, and on the skirts of the great Olive-grove, are a row of low cottages built of mud, but not ill-looking, in which may be seen the rude and simple machinery which constitutes their olive-mills. They commence work about the beginning of November. Some of the fruit falls of itself before the season commences, and is either trodden under foot or washed away by the rains; but when there is a sufficient quantity ripe, the trees are well beaten, and the Olives are picked up from amongst the grass by women and children, and collected into small sacks. These are balanced on each side of an ass or mule, and carried at once to the proprietor of the mill, with whom the fruit is bartered for a certain quantity of oil. The proportion of fruit for oil depends upon the abundance of the harvest, and the period of the season; the fruit that is first gathered being dry, and unproductive compared with that collected later in the season, which swells even till it bursts, and lets the oil run away. At the beginning of the season of 1835, 28 occas* of fruit were exchanged for 5½ occas of oil, or nearly three gallons; but later in the season, only 24 occas, or even less, were given for the same quantity. The weighing of the little sacks as they come in is not the least curious part of the ceremony. The countryman not placing implicit confidence in the master of the machines, invariably brings his own scales with him, while the latter pays the same deference to the honesty of the other by weighing a second time with his scales, and it is not considered etiquette for the buyer to stand very near the sack for fear he should be tempted to give it a slight lift upwards with his foot. One sack weighed 53½ occas, and another after that 46½ occas.

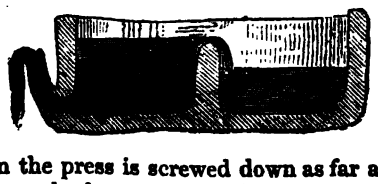
The fruit is now shot out into a large square bin, in a corner of the building, like wheat in a granary, and close to this bin is the little mill for crushing



the Olives,—if one upright stone, attached to a perpendicular beam, deserves that name. These ma-

* An occa measures three pints and a half, and weighs about two pounds and a half.

chines are of two kinds, the one in common use has only one stone attached to a perpendicular beam which rotates with it. A horse is attached by traces to a horizontal pole which runs through the centre of the stone, and to a stick on the other side by a rein ingeniously tightened, so that the horse most unwillingly pulls itself along when once the machine is set in motion. The improved machine has two smaller stones further removed from the central beam, which does not rotate with them, but is made fast to the roof of the building. These are much more effective than the other as they describe larger circles, but require more moving power. The object of the mill is only to crush the Olives, no oil whatever being expressed. A sufficient quantity of fruit being thrown in from the bin at hand, the machine is set in motion, and a man goes before the horse, with a long pole armed with iron, to push the fruit in the path of the wheel. After a few rounds, about two gallons of boiling water is poured in to assist the action of the stone, and more added as required, till the whole mass acquires the consistence of a coarse paste. It is now put into a large jar and carried to the press, where one of the men kneads it with more hot water into a thinner paste, and as often as he fills the shallow dish before him, empties it upon a square cloth of the same coarse and thick material as the capotes or cloaks of the country, and of such strength as to bear the greatest power of the press without bursting. Another man immediately forms the paste with his hands into a square flat mass, folds up the cloth neatly, ties it with a string attached to each, and places it in the press before him, and so on to the number of sixteen or seventeen. The press is now turned down by means of a hand-lever, and when more power is required, a rope is carried from the lever to an upright rotary beam at some little distance, which two men turn round with great rapidity; this part is very amusing. The men make it rather a sport than work, and there is almost a snake-like elegance in their large half-clad and swarthy limbs, as they chase each other round the central beam with extraordinary velocity. The effects of their labour are soon seen. The oil and water run down the sides of the pile of cloths in crimson rivulets into the trough before the press, which, though rudely hewn out of one log of wood, is constructed upon the knowledge of the relative specific gravities of oil and water. It is divided into two parts by a partition that does not come to the top of the trough, but is about two inches below the level of the sides, so that when the oil and water run together into one part, it allows the oil, which is lighter than the water, and consequently floats on the surface, to flow over into the other division of the trough, while the water sinks to the bottom and is conveyed away by a pipe carried upwards on the outside, to the level at which they wish to maintain the water within the trough.



When the press is screwed down as far as possible, it is loosened; hot water is thrown upon the pile to wash off any oil that may remain upon the cloths, which are now removed and the paste within kneaded, but without unfolding the cloths. More boiling water is poured upon each, and they are again placed in the press, to be again removed to undergo for a third time the same operations, till no oil remains. In this manner twenty-eight occas of fruit produce eight, nine, or ten occas of oil. *The water* takes up most of the colouring matter of the fruit, and flows away from the cottages like rivulets of blood, dyeing the ground for some little distance of a deep and beautiful crimson. *The refuse of the fruit* comes from the press in square hardish masses, that are placed before the fire, where they soon become quite dry, and serve for fuel to heat the water that is so constantly required in the various processes. *The oil*, which is of a beautiful light-green colour, is removed from the trough into a large jar close to the press, and after depositing any water or dirt, is poured into skins, having the hair upon the inside. These are weighed before being carried away to the proprietor's house; a common sized one weighed sixty occas. At the proprietor's house it is poured into large earthenware jars, four or five feet in height, which are let into the ground, so that the short necks are alone seen above the surface. Here it remains for at least two months, till all impurities are deposited, but it still retains a greenish colour, never seen in the oil consumed in England, and which makes it less offensive to the prejudices of those unaccustomed to its use, as it appears more like, what it really is, an agreeable vegetable juice, rather than a gross animal oil.

Sometimes the supply of oil falls short, as was the case in November, 1835, when there was scarcely any old oil to be purchased in or near Athens. In November, 1834, the old oil sold for one drachma (rather more than 8½*d.*) an occa (3½ pints), but at the same time in the following year, the same quantity could scarcely be bought for 2½ drachmas (about 1*s.* 8¾*d.*) The presses were consequently crowded with purchasers, but the new oil is almost unfit for the purposes of burning, as it gives a most wretched light.

To keep a press and mill in constant work, to receive the fruit, send away the oil, and attend to the coppers for boiling the water, requires six men. These are paid in oil; it is, in fact, but one continued series of bartering, fruit for oil, and oil for labour, till the produce is carried into the city to be retailed, but the oil being of universal use makes it a most convenient medium of exchange.

The above description answers to the method by which oil is prepared in all parts of Greece and the Ionian Islands, and does not materially differ from the same operations as performed throughout Southern Europe.

The fresh ripe fruit eaten with bread is by no means unpleasant, and when preserved by being sprinkled with salt, is almost the only food allowed to the poorer Greeks during Lent. The oil too enters into all their dishes, nor are they satisfied with it in the pure inodorous and nearly insipid state that we obtain it in this country, but prefer it, especially the lower classes, after it has acquired a rank odour and rancid taste. I have known Greek servants, when offered fish that had been fried in fresh oil, to suit the fastidious palate of an Englishman, refuse to eat it until they had given it a flavour, by cooking it over again with their own rancid oil; but the decided preference that, under similar circumstances, a Chinese would show for *castor oil* is still more peculiar. It is, however, to be regretted, that a prejudice against pure olive oil exists at our own tables, for, when taken in small quantities, especially with vegetables, its use is as natural, and its effects as salutary, as those of melted butter are artificial and pernicious.

G. F. F.

THE SEASONS.

I. Winter.

The changes of the seasons, and the varied phenomena consequent thereon, is a subject well deserving the most patient investigation. We believe, however, that there is no department of human knowledge, interesting and instructive as it is, respecting which a greater degree of error prevails. Almost everything relating to the weather, to the alternations of heat and cold, to the origin of dew and rain, hail, snow, frost, and storms, is encumbered with popular errors. Many of these errors are of great antiquity, and may be traced to defective information respecting what, in the present day, are considered some of the most simple laws of nature. Other errors originated in the absurd rites and superstitions of idolatry; whilst a third class, and that probably the most numerous, is the offspring of the pretended science of astrology, which, to the credit of the present times, is rapidly falling into the contempt it always merited.

As most appropriate to the period of the year in which we are writing, we shall endeavour to explain some of the causes and the effects of the atmospherical changes commonly incident to Winter, which by their constant recurrence are rendered familiar, but which on that very account are probably less attentively studied, and less perfectly understood than other phenomena which happen at longer and more uncertain intervals.

First of all, let us notice the lowness of temperature, or *the coldness of the weather*, which is the most remarkable characteristic of Winter.

There is no fact in philosophy more satisfactorily established, than that the atmosphere which surrounds the earth, is the medium through which the Creator and Preserver of the universe displays the ordinary operations of his providence towards that portion of his dominions, which is allotted to man for a temporary habitation. The air, in which, as in a seamless garment, our planet is enveloped, and which accompanies it in its diurnal and annual revolutions, is generally supposed to be about 45 miles in height. This elevation, great as it may appear when compared with that of our highest mountains, or the greatest altitude attained by the balloon, ($4\frac{1}{4}$ miles,) is not equal to one-eightieth part of the earth's semi-diameter. If we suppose the dark line in the annexed figure to indicate a part of the earth's surface, the faint line will denote the extreme limits of the atmosphere as already mentioned, the proportions being about one-twentieth of an inch on a globe of eight inches in diameter.

It can hardly be doubted, that the sun (independently of its heating and light-giving properties,) the moon, the planets, and comets also, exercise some kind of influence upon our globe, which, as we may reasonably imagine, bears a direct proportion to the relative sizes, distances, and movements of the respective bodies. But it is difficult, if not impossible, to determine what is the precise character of the mutual influences which we suppose to subsist among the members of that system to which the earth belongs. Nor ought this to be matter of surprise. We may rather wonder that so much *is* known, respecting bodies so remote. By the aids of modern science, the sizes, distances, and periodical revolutions of the planets, and their attendant satellites, have been ascertained with almost incredible accuracy,—an accuracy which has no parallel in the computations of time, and distance, and magnitude, which occur in the ordinary affairs of life.

The moon, as being our nearest neighbour in the regions of space, has in all ages been an object of peculiar interest and of unwearying observation; giving occasion, however, to opinions so wild and chimerical, that we find it difficult to believe in the sanity of those by whom they were promulgated. It is unquestionable that the moon exercises a specific influence over the atmosphere and the ocean; but it has also been asserted, and is very generally believed, that its influence is equally extraordinary upon the animal creation; and particularly upon the bodies and minds of mankind, those affected by mental derangement having thereby acquired the name of lunatics.

There are some very curious facts connected with this subject; respecting which, however, it must be confessed that our knowledge is exceedingly limited. The most we can do is carefully to note the effects; the cause is at present veiled in uncertainty. From the testimony of those who have paid attention to such matters, it would seem that the moon-beams possess a cold-producing agency. In France it has been noticed that so late in the Spring as April and May, the leaves and buds of plants, exposed to the full moon, on a clear night, have been frozen, whilst the temperature of the surrounding air has been several degrees above the freezing point. In warm climates, and especially on board ship, instances have frequently occurred, where persons who incautiously, or through ignorance, have slept in the open air with the face exposed to the moon's rays, have had their muscles distorted, their mouths drawn awry, and their sight seriously injured. In some cases these effects have remained for several months; and in others, the individuals thus exposed, have sustained a temporary loss of reason; resembling those labouring under the stupefying effects of narcotic poisons.

It ought to be known that fish, which are hung out of doors to dry, if placed in moon-light are thereby rendered unwholesome. It may not be so in every case; but on several occasions we have witnessed the most alarming symptoms result from eating fish which had been so exposed. One case we remember in which a whole family, consisting of six persons, was placed in imminent danger from the cause just mentioned.

Many other effects, equally remarkable as those referred to, and which are supposed to depend on the moon's influence, could be enumerated; but these hints must here suffice.

It has been stated that the periodical changes peculiar to the different climates of the earth, are effected through the agency of the atmosphere; but in this important work it performs only the part of an auxiliary; the sun, as the source of light and heat, being the primary cause of those changes.—And let it not be supposed that the relative intensity of the sun's rays, or, in other words, their heating property, as experienced at different periods of the year, is occasioned by the earth's nearer approach to, or greater distance from, the sun. Strange as it may appear, the earth, during the period of Winter in this country, is many millions of miles nearer the sun than it is in Summer. Other causes operate, therefore, in producing the variations of temperature on which the aspects of the seasons depend; and the principal of these is the position of the earth with reference to the direction of the sun's rays, and as a consequence of that position, the alternate increase and decrease of the period of day-light.

It cannot escape the notice of the most superficial observer, that, from the 21st of December until the 21st of June, the arc in the heavens described by the sun gradually enlarges; that luminary rising earlier and setting later in proportion as the space it occupies above the horizon increases. Arrived at its extreme northern boundary, the sun, from day to day, rises more towards the south, and on the 21st of December its return to the north recommences.

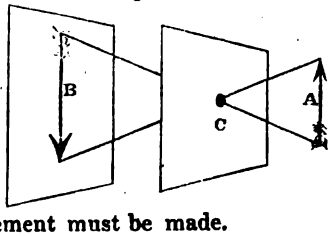
A fact we must not omit here to mention, will be required for the illustration of succeeding parts of our subject. We allude to the periods of the highest and lowest temperatures; which do not occur just when the sun has reached its respective southern and northern limits; but in both cases about four or five weeks afterwards. Thus, the warmest weather generally happens in July or August, and the coldest in January or February.

It will be understood that in speaking as we have done of the sun, we have been describing appearances only. The earth is the body actually in motion, whilst the sun is stationary; and the apparent advance and retirement of the sun through a certain portion of the heavens is occasioned by the earth's motion in the contrary direction.

THE CAMERA OBSCURA.

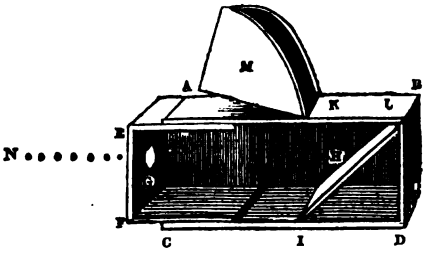
THE Camera Obscura, or *dark chamber*, is an optical instrument, for the purpose of making drawings of objects, which was invented rather earlier than the telescope. If a room be made entirely dark, and a convex lens of two or three feet focus be placed in a hole in the shutter, a beautiful image of all the objects before will be formed in the room behind it, and this image may be received on a sheet of white paper held behind it, but the image will necessarily be reversed. Suppose A, Fig. 1, to be the object, C the shutter, with the lens in the centre, and B the image received on a white screen. If it is required to trace the outline of this picture a different arrangement must be made.

Fig. 1.



The most usual form in which the Camera Obscura is made on a small scale is the following: A, B, C, D, is a

Fig. 2.



small oblong mahogany box, with the side removed to show the internal arrangement; a smaller box, E F, slides easily in and out at one end. In the end of this box, at G, a convex lens is placed, whose focus is rather greater than the length of the larger box. H is a looking-glass placed at an angle of forty-five degrees with respect to the bottom of the box: that is, if a perpendicular line were drawn from I to K, D, B, K, I, would form a square: on the top of the box at L, a square piece of ground glass is placed. The cover M, which works on a hinge, is intended to exclude as much light as possible from the surface of the ground-glass; and when the instrument is in use it is brought down halfway to B.

The rays of light from an object placed at N, pass through the lens G, and reaching the looking-glass H are reflected upwards on the ground-glass L, and an image of the object is seen on its upper surface. This image may be traced with a black-lead pencil, but it is almost impossible to transfer it from the glass. To obviate this inconvenience, Sir D. Brewster recommends the employment of a partially opaque varnish to the surface of a piece of smooth glass. This varnish can be marked with the finest lines of a pencil, and an impression of the sketch conveyed to paper, by slightly pressing it on the drawing with the hand: one of the simplest and the best of the varnishes he used was that of skimmed milk, perfectly freed of all remains of cream.

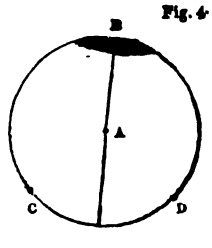
Another form is the following:—the frame-work of this Camera Obscura is made of thin mahogany,

Fig. 3.

and so contrived as to fold up; the inside of this, and of all these instruments, must be painted black. A is the mirror, B the lens, C a white surface on which the image is received; the draughtsman passes his head through an opening on one side, and his hand with the pencil through another, a green curtain surrounding him to exclude the light.

When a Camera Obscura is intended to allow several persons to see the picture at the same time, it is made on a large scale, and great care is taken in preparing the table on which the picture is to be received. The outer portion of the image transmitted by the lens when thrown upon a flat surface, is always distorted, especially when the table is large. To remedy this in some degree, the table is hollowed out like a saucer, the curve being decided by that of the lens itself: thus, A being the centre of the circle which forms the outline of the lens, B will form also the centre of the intended curve of the table; according to this rule, therefore, the curve C D would represent a section of a table adapted to receive the picture through a lens of the same curvature as B.

Fig. 4.



There is a very excellent table of this description in the Camera Obscura in the Observatory at Clifton, near Bristol.

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SOME ACCOUNT OF THE CITY OF ROME. PART VII.

VIEW ON THE TIBER, NEAR THE CASTLE OF ST. ANGELO.

THE BATHS OF TITUS.

"THIS name," says Dr. Burton, "by no means answers to the immensity of the building which once covered great part of the Esquiline Hill, and should more properly be styled the Palace of Titus. This is, in fact, the name which Pliny gives to it." The present ruins extend from the base of the Esquiline Hill near the Coliseum, to one of its summits at the Church of *SS. Martino e Silvestro*, and to another at *S. Pietro in Vincoli*. The site is, to a great extent, occupied by gardens, in various parts of which are to be seen fragments, all once belonging to the same great edifice. The house of Mecænas had previously stood on the same spot, to which, indeed, the Golden House of Nero had extended from the Palatine Hill. Titus employed the materials of both of these edifices, and even of some entire parts, in constructing his baths; this fact is abundantly shown by certain irregularities which the present ruins display. A number of apartments belonging to the baths, were discovered in the sixteenth century; they had lain hidden for centuries under a mass of ruins. It is said that Raffael studied their fresco ornaments, and imitated them in painting the ceiling of the Vatican; and he is accused of having had the rooms filled up again that his thefts might not be discovered. It is certain that they were open in his time, and that they were subsequently filled up; and appearances seem to justify the supposition that they were filled up purposely, and not by the gradual accumulation of soil. But there are other modes of accounting for the filling up, without charging it upon Raffael; the owners of the land, may have wished to clear it for the purposes of cultivation, and these subterranean chambers

would afford most convenient receptacles for the superincumbent rubbish. According to one account, they were filled up to prevent their becoming the hiding-places of banditti. If the fact be true, it furnishes an impressive comment upon the state of the modern, as well as of the ancient city, at that period. In the year 1777 a new excavation was made; but the chief merit of clearing away the rubbish which concealed the chambers is due to the French, who carried on the work with great spirit during their occupation of Rome. The building seems to have originally consisted of two stories: of the upper one but little remains; of the lower there are more than thirty rooms perfectly accessible.

"We passed," says the author of *Rome in the Nineteenth Century*, describing a visit to the Baths,—"the mouths of nine long corridors, converging together like the *radii* of the segment of a circle, divided from each other by dead walls, covered at the top and closed at the end. They must always have been dark. They are *supposed* to have been entrances to the baths, and they are *supposed* to have served for substructions to the theatre above, which is *supposed* to have formed a part of the upper story, of which not a trace remains; and the whole of these suppositions have their source in the inflammable imaginations of Roman antiquaries. Nothing is certain about them, excepting that they are not worth looking at. In one of them are piled up pieces of broken *amphoræ*, marbles of various kinds, and other heterogeneous fragments found in the excavations by the French, among which are some pots of colours. They were analyzed, but nothing new discovered.

"Having passed these corridors, we entered the portal of what is called the House of Mecænas. It is known that the house and gardens of Mecænas stood in this part of the Esquiline Hill, which, before it was given him by Augustus, was the charnel-ground of the common people. The conflagration in Nero's reign did not reach to them; and it is believed, that a part of them was taken by Nero into his buildings, and by Titus into his baths. Antiquaries think they can trace a difference in the brick-work and style of building, between what they consider as the erection of Augustus's and that of Titus's age; and on these grounds, the parts they point out as vestiges of the House of Mecænas are, the entrance, which leads into a range of square and roofless chambers, (called, on supposition, the Public Baths,) and the wall on the right in passing through them, which is partially formed of reticulated building in patches. From these real or imaginary classic remains, we entered a damp and dark corridor, the ceiling of which is still adorned with some of the most beautiful specimens that now remain of the paintings of antiquity. Their colouring is fast fading away, and their very outline, I should fear, must be obliterated at no very distant period; so extreme is the humidity of the place, and so incessantly does the water-drop fall*. By the light of a few trembling tapers elevated on the top of a long bending cane, we saw at least twenty feet above our heads, paintings in arabesque, executed with a grace, a freedom, a correctness of design, and a masterly command of pencil, that awakened our highest admiration, in spite of all the disadvantages under which they were viewed. . . . . Leaving the painted corridor, which is adorned with these beautiful specimens of ancient art, we entered halls, which, like it, must always have been dark, but are still magnificent. The bright colouring of the crimson stucco, the alcove still adorned with gilding, and the ceilings beautifully painted with fantastic designs, still remain in many parts of them; but how chill, how damp, how desolate are now these gloomy halls of imperial luxury! No sound is to be heard through them, but that of the slow water-drop. In one of these splendid dungeons, we saw the remains of a bath supposed to have been for the private use of the emperor. In another we were shown the crimson-painted alcove where the Laocoon was found in the reign of Leo the Tenth. The French, who cleared out a great many of these chambers, found nothing but the Pluto and Cerberus, now in the Capitol, a work of very indifferent sculpture."

The height of the rooms in the Baths of Titus is very great, or as Dr. Burton expressed it, prodigious; and they are comparatively very narrow. Mr. Williams assigns them a height of thirty feet, which must, of course, make them appear still narrower than they are. Many of them are without any trace of windows, as is the case with the most perfect remains of chambers in the Baths of Caracalla. As the ancients were acquainted with the use of glass even for windows, it is presumed that the object of omitting windows here was to render the rooms as cool as possible by excluding the external air.

"In such rooms as these," says Dr. Burton, "in the Baths of Titus, lamps must always have been used; and it may be observed, that there is scarcely a passage in an ancient author, where mention is made of a banquet, but 'the golden lamps,' hanging from 'the roofs,' are always added. According to the hours which the ancients observed for their meals, (the *cæna*, or last meal, being at about three o'clock,) there would have been no need of lights had there been windows to the rooms; which affords another proof that they were frequently constructed without them. Indeed, Grecian architecture seems to derive a peculiar character from the absence of such apertures; if any objection is to be made to the chaste and simple models which ancient Greece has left us, it is that there is a heaviness and a want of relief in the vast masses of solid masonry. The modern Italian architects have gone into the contrary extreme; their aim seems to have been to break every portion of the building into as many parts as possible; and in the pediments of their windows they have been particularly profuse of ornament. The difference is probably to be traced to the fact of the ancients having had few windows in their buildings, and the moderns having many. In such structures as the Palace of Titus, where many ornaments, both in painting and sculpture, were assembled, it might be thought that much of the effect would be lost by their being never seen except by the light of lamps. With respect to sculpture, however, it is well known that there is no greater test of the excellence of the work, than to view it by torch-light; the rising of the muscles, and all those delicate touches of the chisel, which are scarcely observed on the smooth surface of the white marble, are thrown into a much stronger light and shade in this manner. It is not uncommon for parties to visit the Vatican at night, and view the statues by torch-light. The effect is certainly very good; and some pretend to discover that the modern productions appear greatly inferior to the ancient on such occasions. We know that there were formerly some of the finest specimens of sculpture in the Baths of Titus, and the paintings on the walls still remain."

These paintings on the walls consist chiefly of what we now call arabesques; the figures are all very small, and arranged in patterns and borders. They consist of birds, beasts, &c., among which some green parrots may be seen very distinctly; the ground is generally a rich dark red. At the end of one of the rooms is a large painting of some building, in which the perspective is said to be correctly given; this seems to disprove the charge which has been brought against the ancient painters of not understanding the rules of perspective. None of these paintings can, however, be justly regarded as specimens of ancient art; they were intended solely as decorations to the apartments, and were doubtless the work of ordinary house-painters. To judge of the proficiency of the ancient painters from such remains as these, would be as unfair, to use Dr. Burton's remark, as to estimate the state of the arts in England from the sign-posts. Where the walls of the rooms are bare, the brickwork has a most singular appearance of freshness; the stucco also is very perfect in many parts; but the marble, of which there are evident traces on the walls and floors, is gone.

THE SEVEN HALLS OF VESPASIAN.

In one of the gardens forming a portion of the large tract of ground over which the ruins of the Baths of Titus are spread, is a building supposed to have been connected with these baths, and commonly called the *Sette Sale di Vespasiano*,—"the Seven Halls of Vespasian,"—though for what reason it would be difficult even to conjecture. The name was given to it when only seven halls had been opened; there are nine now, and as they form an upper story, it is supposed that there are nine others below them in the lower story which is buried. These halls communicate with each other by means of arches in the partition walls; and the arches are not placed opposite to one another so as to afford a straight view through the whole building in the direction of its length, but are so arranged

* Dr. Burton's account is, on this head, very different. He says that, "Notwithstanding the depth of soil which has accumulated on the top of the building, and which serves for gardens, there are paintings on the ceiling which may be called extremely perfect. The damp seems to have had little or no effect upon them, which is probably owing to the excellence of the Roman brickwork."

JOHN W. PARKER, Printer, West Strand, London.

as to afford a diagonal view through it. The general figure of the building is that of an oblong, which has a curve in the place of one of the longer sides. The partition walls run from this curve across the breadth of the figure. The longest of them has a length of 137 feet; the width of all is the same—17½ feet.

There is no doubt that this building was an immense reservoir. The walls are coated with a very hard plaster, on which are seen three distinct deposits, one above the other, formed by a sediment from the water. These deposits are now so extremely hard that it is difficult to separate a small portion from the wall. Dr. Burton accounts for the three distinct coatings in a very ingenious manner.

"Of the five great aqueducts which brought water into Rome, the Aqua Julia supplied the Esquiline and Palatine Hills. Consequently the Baths of Titus were fed from this stream, and the *Sette Sale* may have formed the reservoir. Now it is known that the Aqua Julia was a union of three streams: the *Aqua Martia* brought to Rome, U. C. (in the year of the city,) 608 or 640, by Q. Martius Rex; the *Aqua Tepula*, which was brought U. C. 627; and the *Aqua Julia*, properly so called, which was introduced U. C. 721, by M. Agrippa. Each stream originally entered the city by itself; but, as the others were brought, they were successively turned into the same aqueduct, and came on one course of arches into Rome. Now it seems not improbable, that the Aqua Martia or Tepula, (whichever was the earliest,) formed the first deposit. It would seem also by another stream being brought in, that the first must have proved deficient; or while the second work was going on, the water might have been withdrawn, and thus we have the first deposit. Then, when the two streams were let in, another deposit began to be formed, which would not incorporate with the first, but lie over it. Lastly, when the Aqua Julia was being introduced, (after an interval of nearly a century,) the same temporary withdrawing of the water might have taken place, and thus the second deposit would have hardened. After this, the third was formed by the three streams united. To allow this, we must assume that the *Sette Sale* were not built as a reservoir for the Baths of Titus, but long antecedent, which is not at all contrary to the appearance of the building. It is, indeed, natural to suppose, that when Agrippa brought the aqueduct to the Esquiline Hill, there was a reservoir constructed for it. It seems to have been the custom with most of the aqueducts. The remains of a reservoir for the Claudian Aqueduct, are still to be seen, near the temple of Minerva Medica; and what is called the *Castello dell' Acqua Giulia*, is always allowed to have been a reservoir, though it is disputed for what water. The *Piscina Mirabile*, near Baiæ, and the Labyrinth near Pozzuoli, are also instances of this custom prevailing."

Our engraving in page 80 exhibits a view in the "Seven Halls."

AQUEDUCTS.

"I DO not know anything more striking," says Simond, "than these endless arches of Roman aqueducts, pursuing with great strides their irregular course over the desert;—they suggest the idea of immensity, of durability, of simplicity, of boundless power, reckless of cost and labour, all for a useful purpose and regardless of beauty. A river in mid-air, which had been flowing on ceaselessly for fifteen, for eighteen hundred, or two thousand years, poured its cataracts into the streets and public squares of Rome when she was mistress, and also when she was the slave of nations; and quenched the thirst of Attila and of Genseric as it had before quenched that of Brutus and Cæsar, and as it has since quenched that of beggars and of popes. During those ages of desolation and darkness, when Rome had almost ceased to be a city, this artificial river ran to waste among the ruins, but now fills again the numerous and magnificent fountains of the modern city. Only three out of eleven of these ancient aqueducts remain entire, and in a state to conduct water;—what then must have been the profusion of the supply in ancient Rome!"

The term aqueduct, or more correctly aquæduct, composed of two Latin words, signifies in its literal and more extended sense, a duct, or conduit of water; and in this sense the pipes which carry the water under our streets are aqueducts. But the application of the word has been restricted by usage to a peculiar kind of conduits,—those raised partly, if not entirely, above the surface of the ground, for the purpose of conveying water in a slightly descending stream over valleys and plains, from one comparatively high point to another. These aqueducts were very extensively used by the Romans, not only at Rome itself but at many of their great cities in the three divisions of the globe with which they were acquainted. "The boldness of the enterprise, the solidity of the execution, and the uses to which they were subservient, rank the aqueducts among the noblest monuments of Roman genius and power. The aqueducts of the capital claim a just pre-eminence; but a curious traveller, who, without the light of history, should examine those of Spoleto, of Metz, or of Segovia, would very naturally conclude, that those provincial towns had formerly been the residence of some potent monarch. The solitudes of Asia and Africa were once covered with flourishing cities, whose populousness, and even whose existence, was derived from such artificial supplies of a perennial stream of fresh water."

Both within and without the walls of Rome, fragments of aqueducts may still be seen. The first was constructed in the year 441 of Rome, when Appius Claudius the Censor brought a stream from a distance of seven miles, which was called from him, *Aqua Appia*. We have a detailed account of the state of the aqueducts of Rome in the reign of Nerva, written by Frontinus his engineer. He tells us that nine different "waters" came into Rome then. A writer of the age of Diocletian makes the number nineteen, and another of the sixth century reduces it to fourteen. The Gothic chieftain Vitiges broke down parts of them without the walls, in order to deprive the city of water when he besieged it. Of the fragments yet remaining, "some," says Mr. Woods, "are of stone, others of brickwork, but the former cannot be traced for any continuance; and while two or three are sometimes supported on one range of arches, in other places almost every one seems to have a range to itself. It is curious to trace these repairs, executed perhaps fifteen centuries ago; the execution of the brickwork, in most instances, or, perhaps, in all, shows them to be decidedly prior to the age of Constantine, and the principal restorations, in all probability, took place when the upper water-courses were added. They generally consist of brick arches, built within the ancient stone ones, sometimes resting on the old piers, but more often carried down to the ground, and in some cases the whole arch has been filled up, or only a mere doorway left at the bottom. Sometimes this internal work has been wholly or partially destroyed; and sometimes the original stone-work has disappeared as the owner of the ground happened to want bricks or squared stones. In one place the ancient piers have been entirely buried in the more recent brick-work; but the brick-work has been broken, and the original stone-work taken away, presenting a very singular, and at first sight, wholly unaccountable, appearance; in other parts, the whole has fallen apparently without having had these brick additions, for a range of parallel mounds mark the situation of the prostrate piers."

Three of the aqueducts of ancient Rome have been repaired and restored so as to afford the modern city an abundant supply of water. These are, first, the *Aqua Virgo*, which was formed by Agrippa, (the minister of Augustus,) and which entered Rome on the north, at the *Porta Pinciana*, after a course of twelve miles, subterraneous for about eleven, and on arches above ground for the remaining one mile; second, the *Aqua Alsietina*, called also *Sabatina*, *Augusta*, and *Trajana*, which was brought by Augustus from the Lake Sabatinus (now Bracciano) on the west of Rome, and which entered the city at the *Porta Janiculensis*, (now Porta S. Pancrazio) after a course, nearly all subterraneous, of twenty-two miles; and third, the *Aqua Claudia*, which was begun by Caligula and finished by Claudius, being brought from the mountains near Subiaco, on the south-east of Rome, and entering the city at the *Porta Prenestina*, (now *P. Maggiore*,) after a course of forty-six miles, for more than ten of which it was raised upon arches*.

The Aqua Virgo was restored by Pope Nicholas the Fifth; it now supplies the Fountain of Trevi, and is called *Acqua Vergine*. The Aqua Alsietina was restored by

* For the last 6½ miles of its course the arches of this aqueduct were continuous, and supported the channel of the *Anio Novus*, besides that of the Aqua Claudia, both of which streams come from the country near Subiaco. The Anio Novus had a course of more than sixty miles; for the first twelve miles it was carried on arches; it then went under ground, and emerging, when it came within six miles and a half of Rome, was carried to the city on the same range of arches as supported the Aqua Claudia, but in a channel above that. At the Porta Maggiore the two channels of this aqueduct may be observed.

Paul the Fifth in 1610, and is now called *Acqua Paola;* it supplies the fountains of St. Peter's. The Aqua Claudia was partially restored in 1587 by Sixtus the Fifth, from whose conventual name of *Fra Felice* (or Brother Felix) it is now called the *Acqua Felice;* it supplies the fountain of Termini.

Of the oldest aqueduct of ancient Rome, the Aqua Appia, only a small portion close to the city was raised upon arches; and of these arches no remains exist. The Aqua Martia (which we have already mentioned in describing the "Seven Halls of Vespasian,") had a course of sixty miles, for the last seven of which it was raised upon arches; and of these arches considerable remains exist. Near the gate of S. Lorenzo may be seen a fragment of this aqueduct with its three water-courses; and at some distance from the walls, the line of arches may be traced for nearly two miles. "Some," says Forsyth, "have proposed the restitution of this aqueduct: 'but Rome,' say the Romans, 'has more water than it wants.'—'Give it then to the Campagna.'—'The Campagna has no inhabitants to drink water.'—'And why has it no inhabitants? but for want of good water as well as good air.'"

Again, he asks, "Why do these aqueducts cross the Campagna in courses so unnecessarily uneven, long, and indirect? Several motives have been alleged, all of which may have influenced the ancients; but their chief motive, in my opinion, was to distribute part of their water to the Campagna itself, and to diffuse it there like the veins in a vine-leaf. Besides this general circuit, the Romans bent their aqueducts, into frequent angles like a screen; not so much to break the force of their currents as to give stability to the arcades."

The constant use of aqueducts by the Romans has been cited as a proof that they were ignorant of the principle in hydrostatics, that water will always rise to the level of its source; and their patient industry has been ridiculed, in taking so much trouble to convey upon arches of brick or stone, what might have been brought in pipes underground. "How far," says Dr. Burton, "or how long, the Romans were really ignorant of this principle, I cannot pretend to say; perhaps, when they first erected arches for this purpose, they were not aware that the labour might have been saved; but it is difficult to deny that many Roman aqueducts were constructed in this manner after the principle was known. The Meta Sudans, a fragment of which still exists near the Coliseum, is said to have been a fountain; and it is evident that the water which supplied it was not raised by mere mechanical means. Pliny mentions one hundred and five fountains (salientes) in Rome; and, from the Latin term for a fountain, it appears certain that they resembled those of modern times, and that the water was thrown up merely by its own pressure. But another passage of Pliny is more decisive, and ought to set the question at rest as to the science of his days; he says, 'The water, which is wanted to rise to any height, should come out of lead. It rises to the height of its source.' In another place he observes, 'the ancients carried their streams in a lower course, either because they were not yet acquainted with the exact principle of keeping a level, or because they purposely sunk them underground, that they might not easily be interrupted by the enemy.'"

Although it is thus evident that the hydrostatical principle was not wholly unknown to the Romans, still it is doubted whether they so far understood it as to believe aqueducts unnecessary, and, consequently, whether they constructed their aqueducts rather from reasons of policy than from ignorance.

The aqueducts of ancient Rome discharged their streams into reservoirs, called *castella,* from which the water was distributed throughout the different districts of the city in leaden pipes. The remains of some of these *castella*, or at least ruins which the antiquaries take to be such, are still to be seen.

THE FORUM OF TRAJAN.

The Forum of Trajan is often spoken of as having been the most wonderful of all the wonders of Ancient Rome. It was the work of the celebrated architect Apollodorous, of whom Mr. Woods says, that "every morsel which we see of his works, makes us regret that we do not see more of them." It occupied the space between the Capitoline and Quirinal Hills; and within its circuit were a palace, a gymnasium, a library, triumphal arch, porticoes, &c., many of which were ornamented with equestrian statues and military ensigns gilt—some of them spoils of the Dacian wars. Its principal ornament was the magnificent pillar or column which still remains erect and nearly perfect; but another very famous one was an equestrian statue of Trajan in gilt bronze. Its whole length is supposed to have been about 1150 feet, and its general width 470 feet. Along the sides were rows of columns; at one extremity stood the temple of Trajan, and on the opposite one, a triumphal arch. About the centre stood the large and splendid "Ulpian Basilica." The whole of its area—even that part exposed to the open air—was paved with marble.

This Forum served, amongst other purposes, to use the language of Sir J. Hobhouse, to perpetuate the memory of the good and great—or of such as in the declining ages could pretend to that distinction. We know that Marcus Aurelius erected statues in this Forum to all those who fell in the German war, and that Alexander Severus transferred thither those of other celebrated personages from other sites. "The same place was devoted to the labours of artists and literary heroes; here the poets and others recited their compositions, perhaps in the Ulpian library; and here their images were allowed a place amongst conquerors and monarchs. The sight of this Forum would furnish a singular supplement to ancient history, and rescue from oblivion many who were as much the delight and admiration of their contemporaries, as Cicero and Virgil."

Ammianus Marcellinus tells us, that when the Emperor Constans entered Rome, A.D. 356, "and came to the Forum of Trajan, a structure which I conceive to be unique in the world, and deserving the admiration even of celestial beings, he was struck with astonishment, casting his thoughts over its gigantic edifices which it is impossible to describe, or for any mortals to imitate. Giving up, therefore, all hopes of attempting anything similar, he said that the only thing which he would or could imitate, was the horse on which the emperor sat. Upon which Hormisdas, of the royal family of Persia, who was near him, said, 'First order a stable to be built similar to this if you have the means: may the horse which you purpose forming, be as successful as that which we are looking at.'" At what period the destruction of this beautiful Forum took place, we are not informed; this, however, we learn, that it was not occasioned by either Alaric or Genseric; for Cassiodorus, who wrote about the year 500, says, when speaking of the most remarkable objects to be seen in the city, that "The Forum of Trajan is a perfect miracle, if we inspect it even with the utmost minuteness." Pausanias mentions among its richest ornaments two statues, one of Nicomedes, king of Bithynia, in ivory, and another of Augustus, executed in natural *electrum*, a substance apparently of a metallic nature, found, although rarely, on the banks of the Po.

At an early period, however, in the destruction of Rome, the Forum of Trajan—the noblest structure as it is called in the ancient city—had partaken of the general desolation; and "we may fairly pronounce that long previously to the twelfth century, the base of the Quirinal had begun to assume its ancient form, ere it had been cleared by the subjects of Trajan." In 1480, this Forum was completely choked up by 200 houses, three towers, and three churches.

Paul the Third opened the base of the column, and in the time of Flaminius Vacca, an arch was dug from under ground, perhaps in the pontificate of the same pope, and the flooring of the Forum was discovered, but immediately shut up again. "The late excavation enables us at last to tread the floor of ancient Rome. The replacing the fragments of the columns on their bases, and the judicious arrangement of the other marbles, has created an effect little inferior to the wonders of Pompeii. The stranger must be much struck with the massive *Greek* dimensions of the fragments when compared with the space in which so many buildings were raised. Here we have a Forum with its porticoes, and statues, and tribunals; a basilica with a double internal portico on every side; a quadrangular court or atrium also adorned with enormous columns; two libraries, a triumphal arch, the great column, and the portion of a temple, crowded into a space not so considerable as one of our smallest London squares."

The site of the Forum of Trajan is fortunately identified by the magnificent pillar still erect; and recent excavations have led to some interesting discoveries. "Marble pavement in its original situation, steps, foundations of walls, numerous fragments of granite columns, and four of the Corinthian bases belonging to them, remain in their places; and these, with the help of several pieces of travertine also unmoved, and evidently intended to receive similar bases, have enabled the directors to put the fragments in proper

situations. What is principally laid open is the Basilica; and for this, it was necessary to destroy several houses and two convents. The width of the part now exposed, is believed to be about half the length of the Basilica. Of the libraries, antiquaries have thought that they distinguished some vestiges near the column; but very little of the situation has been examined, and nothing of that of the Temple of Trajan, erected afterwards by Hadrian. The remains of some piers were found on the north side of the column, and indications of their having been altered and partly removed, in order, as is imagined, to make room for the access to this temple. Two churches and a palace are in the way of any further researches in the direction in which, if anywhere, the remains of the Temple of Trajan would probably be found; and independently of this, the great extent of the ground required to be excavated in order to display the whole design, and the difficulty and expense of preserving it after it is exposed, deprives one of all hope of seeing it executed. The column still remains a noble monument of the taste and skill of the architect Apollodorus."

THE PILLAR OR COLUMN OF TRAJAN.

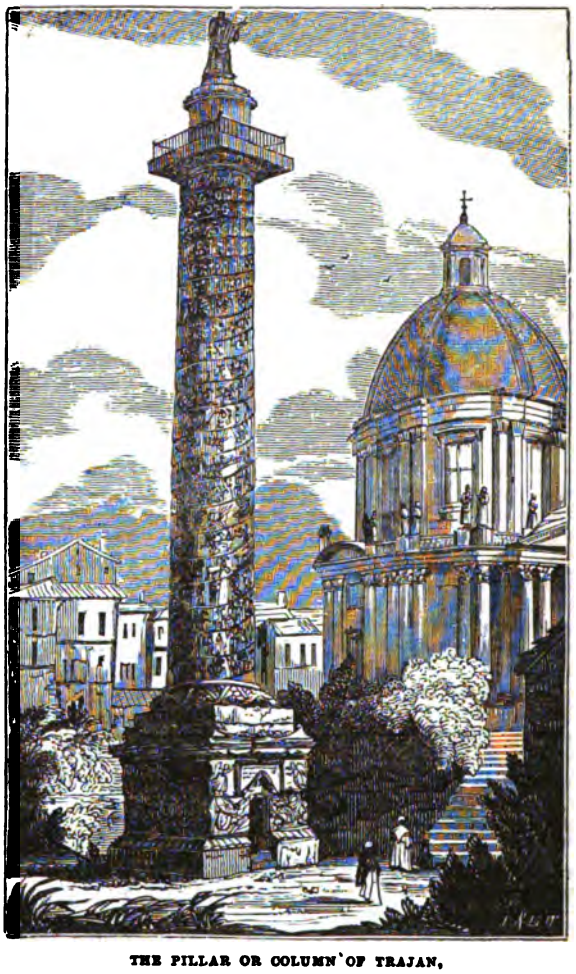
TRAJAN'S Pillar is the only structure in his Forum which has survived the accidents of time and fortune. It was erected in the year of our Lord 115, by the senate and people of Rome, to commemorate the victories of Trajan in his two Dacian campaigns. The first of these was undertaken in the year 101, and lasted three years; its result was honourable to the Roman arms, as the fierce Dacians were compelled to sue for peace. The second was undertaken in 105, and concluded in the next year; in this, the Dacian king having destroyed himself to avoid capture or defeat, his dominions were subdued by Trajan and annexed to the empire. The column was erected during Trajan's absence in an expedition against the Parthians and Armenians; and although it may have been begun before his departure, it is certain that he never saw it finished, as he died at Seleucia in 117, without returning to Rome. His ashes were brought home and placed in a golden ball at the top of the pillar, "which was a singular honour," says Dr. Burton, "on account of the custom which prohibited any burials within the walls." Some accounts place this golden ball in the hand of the statue at the top of the pillar, and others deposit it at the bottom; the testimony of a coin is in favour of the former. The ball itself is said to be still preserved, and to be that which is seen on the milestone upon the balustrade of the modern Capitol.

The height of this pillar, including the statue which formerly surmounted it, is reckoned by ancient writers at one hundred and forty feet. As it at present stands without the statue, its height is one hundred and twenty-eight modern Roman, or one hundred and twenty-four English feet. When this colossal statue was thrown down is not known. The feet were standing in the time of Pope Sixtus the Fifth, and the head was found in the rubbish at the base. The statue of St. Peter now on the summit is eleven feet high, and of gilt bronze; it was put up by Sixtus the Fifth in 1587.

The whole pillar is formed of thirty-three large blocks of marble, of which eight are used in the base, twenty-three in the shaft, one in the capital, and one above it. The diameter of the shaft is eleven feet two inches at the bottom, and ten feet at the top. The base is square, and measures twenty feet on each side; it is covered with trophies, and at each corner is an eagle holding in his talons a wreath of oak, which extends from the one to the other all round. Inside the pillar is a spiral staircase cut out of the marble blocks, and leading to the summit by one hundred and eighty-four steps; the light is admitted by forty-three apertures. On the base is an inscription, which is perfect except in one small portion, where the letters have been defaced by buildings erected against the pillar in the middle ages; and as usual, the antiquaries have eagerly laid hold of the opportunity to kindle a formidable disputation concerning the missing letters. The doubtful part of the inscription is certainly an important one, for it is that which states the object of erecting the column; but all the various readings proposed lead to the same interpretation in the end. The tenour of the inscription is this,—that the senate and people of Rome erected the column to Trajan, &c., "for the purpose of declaring of how much of its height the mount and the place had been deprived by such great labours."

Considerable discussion has arisen concerning the meaning of this declaration, or rather the inference to be drawn from it. It is supposed by some, that the Capitoline and Quirinal Hills were originally united, or one and the same hill, and that to form his Forum, Trajan cut them asunder, and cleared out a sufficient space between them.

"It has been thought by some," says the Italian geologist Brocchi, "that, before the reign of Trajan, the Quirinal was always connected with the Capitoline Hill; and, in support of this opinion, they adduce the inscription which may be read on the pedestal of the great column, erected between these two hills in honour of that emperor. Those who hold this opinion, consider that the inscription indicates the depth of the cutting made, in order to separate the one hill from the other, as corresponding to the height of the monument itself. We leave it to archæologists to interpret this mutilated inscription at their pleasure, but in whatever manner it may please them to do so, it can never be concluded that the capitol was once connected with the Quirinal. These two hills were entirely distinct from the first ages of Rome, and the fact is so obvious, that long arguments are not needed for its demonstration."



THE PILLAR OR COLUMN OF TRAJAN.

The opinion which Brocchi entertains, and which is now generally entertained, is this,—that Trajan enlarged the valley, which had always existed between the two hills, so as to render the area of his Forum level and more spacious, and that this operation consisted essentially in lessening the steep inclination of the Quirinal, by removing the earth for a distance as high up as corresponded with the capital of the column, thus obtaining a gentle slope which conducted from the mount to his Forum. Dr. Burton remarks, "that, whatever the true reading of the inscription may be, enough remains to prove the extraordinary fact, that as much soil was cut away to form this Forum as equalled the height of the pillar. It does not, however, follow, that the Quirinal Hill ever extended to the site of the column; the work which Trajan undertook may have been in a different part of the Forum."

We have now to describe the most curious and the most

remarkable part of this column, namely, the bas-reliefs which cover the shaft, running round it in a spiral band, which makes twenty-two revolutions in passing from the base to the capital. The subjects of these bas-reliefs are the victories of Trajan in his Dacian campaigns. The whole number of figures sculptured is about 2500; the figure of Trajan himself is repeated more than fifty times. At the lower part of the column the human figures are about two feet in height; as they ascend, and thus become further removed from the eye, their size is increased, till at the top of the column they have nearly double the height that they have below. As a matter of course the height or width of each bend of the spiral increases similarly. These bas-reliefs are executed with great delicacy and spirit, but they possess for us a high value of a different kind.

"The Roman dress and manners," says Dr. Burton, "may receive considerable light from these bas-reliefs. We find the soldiers constantly carrying their swords on the right side. On a march they are generally bare-headed; some have no helmets at all; others wear them suspended to their right shoulder; each of them carry a stick over the left shoulder, which seems to have been for the purpose of conveying their provisions. We may observe a wallet, a vessel for wine, a machine for dressing meat, &c. We know, from other accounts, that they sometimes carried sixty pounds, and food for seventeen days; they never carried less than enough for three days. Their shields are oblong, with different devices upon them. Their standards are of various kinds, such as a hand within a wreath of laurel, which was considered a sign of concord. Pictures also were used, which were portraits of gods or heroes. The soldiers wear upon their legs a kind of tight pantaloon, reaching a little below the knee, and not buttoned. The Dacians have loose pantaloons, reaching to the ancle, and shoes; they also carry curved swords. The Sarmatian cavalry, allies of Decebalus, [the Dacian King,] wear plate-armour, covering the men and horses. These were called Cataphracti, or Clibanarii; and the words of Ammianus exactly answer the representation on the column. 'Their armour was a covering of thin circular plates, which were adapted to the movements of the body, and drawn over all their limbs, so that in whatever direction they wished to move, their clothing allowed them free play by the close fitting of its joints.'

"Some Roman soldiers have also plate-armour, but they are archers. The horses have saddles, or rather cloths, which are fastened by cords round the breast and under the tail. The Dacian horses are without this covering; and the Germans, or some other allies, have neither saddles nor bridles to their horses. We might observe several other particulars, such as a bridge of boats over a river, and that the boats everywhere are without a rudder, but are guided by an oar fastened with a thong on one side of the stern. The wall of the camp has battlements, and the heads of the Dacians are stuck upon it. The Dacian women are represented burning the Roman prisoners. We may also see the *testudo*, formed by soldiers putting their shields together in a compact mass over their backs; also, the sacrifice called suovetaurilia. Victory is represented as writing with a pen upon a shield."

"Trajan's column," says Forsyth, "considered as a long historical record, to be read round and round a long convex surface, made perspective impossible. Every perspective has one fixed point of view, but here are ten thousand. The eye, like the relievos of the column, must describe a spiral round them, widening over the whole piazza; hence, to be legible, the figures must be lengthened as they rise. This license is necessary here, but in architecture it may be contested against Vitruvius himself."

Concerning the merits of the column, as a whole, we quote the following remarks from the *Letters of an Architect*.

"It may be said that one column of this sort is very much like another, and that there is very little room for the merit of the architect; but if you were to go two or three times to the column of Antoninus, and return to that of Trajan, you would feel the great superiority of the latter, though it might puzzle you not a little to find out in what that superiority consisted. This magnificent column must always have been conspicuous as it is now, rising above the Basilica and all the buildings of the Forum; but the pedestal could hardly be seen, except from the confined little court in which it stood. This apparent disproportion is one of the secrets of effect in architecture. You show large and lofty edifices from large spaces it is true, but then you should also endeavour sometimes to bring great things into contrast with little spaces. Nothing impresses the idea of size more strongly; and when again you see the edifice from a larger space, perhaps over the tops of smaller buildings, the imagination carries on the idea of size to all its accompaniments."

THE MOLE OF HADRIAN, OR CASTLE OF ST. ANGELO.

> Turn to the Mole which Hadrian reared on high,
> Imperial mimic of old Egypt's piles,
> Colossal copyist of deformity.

The *Moles Hadriani*, or Mole of Hadrian, was erected by the emperor whose name it bore, to serve for his mausoleum; he is thought to have raised it in imitation of Augustus, whose mausoleum stood at a short distance on the opposite, or left bank of the Tiber, and has not yet altogether disappeared, although its confused remains are surrounded and hidden by modern buildings. Like its prototype, the Mole of Hadrian was circular; it consisted of three stories, each considerably smaller in diameter than the one below it, and the whole resting on a square basement. It is supposed that the first and second stories were adorned with columns and statues around their circumference, and that the third was crowned by a cupola, and a statue of Hadrian. Procopius, a writer of the sixth century thus describes it:

"The tomb of the Emperor Hadrian stands without the Porta Aurelia, at about a stone's throw from the walls, and is undoubtedly well worth seeing; for it is built of Parian marble, the square stones (of which the basement is built,) are joined alternately to each other, without the admixture of any cement, and it is divided into four sides, of equal dimensions; each is of such a length, that a stone thrown from one angle would but just reach the other. In height it surpasses the walls of the city. There are also statues on it of men and horses, finished with wonderful skill out of Parian marble. The inhabitants, a long time ago, observing it stand like a tower overlooking the city, carried out two arms from the walls to the tomb, and, by building them into it, so united it, that henceforward it became part of the walls, for it has a very lofty appearance like a tower, and overhangs the gate in that quarter."

Of this magnificent mausoleum, the basement and the first circular story, stripped of all its ornaments, and encumbered with an irregular mass of modern buildings, still remain. The spectator should always bear in mind, that, with these exceptions, he sees nothing in the present structure which dates earlier than the beginning of the fifteenth century; and that even the circular mass itself has, since that period, been much changed by the explosion of the powder-magazine in 1497, and the final reparation which it then underwent. This enormous tower is imposing from its size, the circumference being 576 feet.

During the siege of Rome by the Goths under Vitiges, in 537, the Mole of Hadrian was converted into a temporary fortress, and to this period is to be referred the destruction of the statues which formerly adorned it; the besieged threw them down upon their assailants. When the scheme of dragging the Tiber for antiquities was carried into execution in 1819, great hopes were entertained that some of these statues would be found, but these hopes were disappointed. The sanguine supporters of the scheme seem to have forgotten, as Dr. Burton remarks, that marble statues, probably of colossal size, could not easily be used as weapons of offence, unless they were first broken in pieces. Indeed Procopius says distinctly that they were so:—"having broken the statues," he tells us, "which were of marble, and of great size, they threw down large stones made out of their fragments on the heads of the enemy." Two statues were, however, found in the ditch of the fortress in the early part of the seventeenth century, but whether they belonged to the collection which ornamented the mausoleum is unknown.

It is probable that the mausoleum has been used as a place of defence before the attack of Vitiges, perhaps during Alaric's invasion. It afterwards fell into the hands of Totila, and the garrison which held it after his death, rendered it a very strong fortress, surrounding it with walls, which they connected with those of the city. It was surrendered by the Goths in 553, during Justinian's reign, and during the period of the Exarchate it was held for the Greek emperors. Luitprand, a writer of the tenth century, thus describes its appearance in his time:

"In the entrance to the city of Rome there is a fortifi-

cation of astonishing workmanship and astonishing strength; in front of the gate is a bridge of great consequence over the Tiber, which is the first in going in or out of Rome; nor is there any other way of passing, except over this bridge, but this cannot be done except by leave of those who guard the fortress. The fortress itself is of so great a height, that a church, which is built at the top of it, in honour of the Archangel Michael, chief of the heavenly host, is called the Church of St. Angelo in the Heavens." There is still a figure of an angel upon the top; but a writer of the sixteenth century speaks of it as a thing which had existed, but did not exist in his days.

In the severe contests, of which Rome was continually the theatre, between the popes, the antipopes, the barons, and the people, the Mole of Hadrian figures conspicuously. The first pope who obtained possession of it was John the Twelfth, who filled the papal chair in the middle of the tenth century. Succeeding popes and antipopes at times held it securely, and at times were driven out of it by the turbulent barons and citizens. Its importance, as an engine for overawing a rebellious people, did not escape the discernment of the pontiffs; neither did it escape the observation of the people themselves, who deliberately declared by a public decree, that when they should obtain possession of it, they would uproot it from its very foundations. In 1378 this decree was near being carried into effect; the partisans of Pope Urban the Sixth, having taken it from those of the Antipope Clement, in spite of the garrison which the French cardinals, who opposed Urban's election, had placed there, proceeded as far as they could in the work of destruction, and contrived to disfigure the structure and reduce it to its present shapeless mass. They stripped off the marbles, and destroyed the form of the square basement, and were only stopped from further mischief by the strength and solidity of the building.

The fortress remained dismantled till 1392, when the two Romani said to Pope Boniface the Ninth, "If you wish to maintain the dominion of Rome, fortify the Castle of St. Angelo." He followed their advice, and the event is thus significantly recorded by a great Roman antiquary. "Pope Boniface the Ninth first fortified the Mole of Hadrian, and established the dominion of the Roman Pontiffs." The people foresaw and felt the fatal consequences. They petitioned Innocent the Seventh, the successor of Boniface, to restore to them "their liberty, the capitol, the Milvian Bridge, and the Mole of Hadrian." They even seized, for a moment, the first three; in an attack on the mole they were repulsed by the pontifical troops, and completely routed in the gardens of Nero, in the Vatican. The popes had now no longer to fight for this fortress with the people, for the future they only fought for it with one another.

The castle underwent many alterations and additions at the hands of succeeding pontiffs. Alexander the Sixth constructed the brickwork on the summit, and also the bastion; to him likewise is to be attributed the secret communication with the Vatican. His additions to the works enabled the castle to withstand the siege of the Imperialists under Charles the Fifth, and it was at last surrendered, not taken by assault. Paul the Third and Paul the Fourth also did much towards ornamenting and strengthening it; but the great engineer was Urban the Eighth, who occupied the pontifical throne from 1623 to 1644; he added a mound, a ditch, a bastion, and a hundred pieces of cannon, thereby making it appear, as a Roman antiquary quaintly observes, that "his bees (the arms of his family, the Barberini,) not only gave honey, but had stings for the fight."

The most interesting event in the history of this castle, is the siege of it by the Imperialists in 1527, when they were led by Charles de Bourbon, (commonly called the Constable de Bourbon, as he was Constable of France,) on his celebrated expedition for the plunder of Rome. He arrived before the walls of that city on the 5th of May; and on the following morning at daybreak commenced the assault. He was himself the first to mount the walls, and he was also the first who fell; Benvenuto Cellini, the sculptor, tells us, in his amusing memoirs, that it was he who fired the fatal shot, but there is of course a great uncertainty upon the point. The city was captured and exposed to ravages greater, perhaps, than it had ever suffered in its decline, from the barbarian Goths and Vandals as we style them. Pope Clement the Seventh withdrew to the Castle of St. Angelo, where he sustained a siege in company with thirteen cardinals.

During the siege Benvenuto Cellini directed the artillery of the castle, and according to his own account, made sad havoc among the Imperialists. Indeed, he tells us plainly, that but for him the castle would have been taken when the city fell. After killing the Constable, he and a companion contrived to make their way to the gate of the castle: "When we arrived at the gate above mentioned," he says, "part of the enemy had already entered Rome, and we had them at our heels. The castellan having thought proper to let down the portcullis, there was just room enough made for us four to enter. No sooner had we entered than the Captain Pallone de Medici pressed me into the service because I belonged to the Pope's household, and forced me to leave Alessandro very much against my will. At this very juncture Pope Clement had entered the castle of St. Angelo by the long gallery from St. Peter's, for he did not choose to quit the Vatican sooner, never once dreaming that the enemy would storm the city. As soon as I found myself within the castle walls I went up to some pieces of artillery which a bombardier named Giuliano, a Florentine, had under his direction. This Giuliano standing upon one of the battlements, saw his house pillaged, and his wife and children cruelly used: fearing to shoot any of his friends, he did not venture to fire the guns, but throwing the match upon the ground made a piteous lamentation, tearing his hair, and uttering the most doleful cries. His example was followed by several other gunners, which vexed me to such a degree, that I took one of the matches, and getting some people to assist me who had not the same passions to disturb them, I directed the fire of the artillery and falcons where I saw occasion, and killed a considerable number of the enemy. If I had not taken this step, the party which entered Rome that morning, would have proceeded directly to the castle; and it might possibly have been a very easy matter for them to have stormed it, as they would have met with no obstruction from the artillery. I continued to fire away, which made some cardinals and gentlemen bless me and extol my activity to the skies. Emboldened by this I used my utmost exertions: let it suffice that it was I who preserved the castle that morning, and by whose means the other bombardiers began to resume their duty; and so I continued to act the whole day."

Cellini was then posted by the Pope's desire with five great guns in the highest part of the castle; "I obeyed his orders," he says, "with alacrity, and had better success than if I had been following my own business." Of the marvellous skill with which he performed the duties of this new station, Cellini has left us an accurate account, embellished in his characteristic manner with various anecdotes more amusing, as Mr. Roscoe, (from whose spirited translation of the *Memoirs* we have quoted,) says than credible.

"There passed not a day," he says, "that I did not kill some of the army without the castle. One day, amongst others, the pope happened to walk upon the round rampart, when he saw in the public walks a Spanish colonel, whom he knew by certain tokens; and understanding that he had formerly been in his service, said something concerning him, all the while observing him attentively. I, who was above the battery, and knew nothing of the matter, but saw a man who was employed in getting the ramparts repaired, and who stood with a spear in his hand, dressed in rose colour, began to deliberate how I should lay him flat. I took my swivel, which was almost equal to a demi-culverine, turned it round, and charging it with a good quantity of fine and coarse powder mixed, aimed it at him exactly; though he was at so great a distance that it could not be expected any effort of art should make such pieces carry so far, I fired off the gun, and hit the man in red exactly in the middle. He had arrogantly placed his sword before him in a sort of Spanish bravado, but the ball of my piece hit against his sword, and the man was seen severed in two pieces. The pope, who did not dream of any such thing, was highly delighted and surprised at what he saw, as well because he thought it impossible that such a piece could carry so far, as by reason he could not conceive how the man could be cut into two pieces. Upon this he sent for me, and made an inquiry into the whole affair. I told him the art I had used to fire in that manner; but as for the man being split into two pieces, neither he nor I was able to account for it. So falling upon my knees I entreated his holiness to absolve me from the guilt of homicide, as likewise from other crimes which I had committed in that castle in the service of the church. The pope lifting up his hands, and making the sign of the cross

over me, said that he blessed me, and gave me absolution for all the homicides I had ever committed, or ever should commit, in the service of the apostolical church. Upon quitting him I again went up to the battery, and continuing to keep a constant fire, I scarce once missed all the time; my drawing, my elegant studies, and my taste for music, all vanished before this butchering business; and if I were to give a particular account of all the exploits I performed in this infernal employment, I should astonish all the world; but I pass them by for the sake of brevity."

It was the fortune of Benvenuto Cellini, at a subsequent period, to become a prisoner in the fortress where he had performed these prodigies of gunnery. He contrived upon this occasion to employ his skill in effecting an escape, the particulars of which he has detailed with considerable minuteness in his memoirs. He succeeded in descending from the battlements of the castle undetected and unhurt; but in attempting to scale one of the outer walls, he fell, and became insensible. On recovering his senses, he imagined he had been beheaded, and was in purgatory. Notwithstanding the injury he had received, he contrived to crawl away; and though the pontiff, Paul the Third, had himself, in his youth, made his escape from the same confinement; he caused Cellini to be again committed to the prison, where he suffered incredible hardships, and witnessed still more incredible visions.

The castle of St. Angelo received the appellation which it now bears in the pontificate of Gregory the Great, who, in crossing the bridge of St. Angelo as he went to offer up prayers for the deliverance of the Romans from a pestilence with which they were afflicted, beheld, according to the story, on the summit of the Moles Hadriani, the figure of an angel sheathing a sword. In commemoration of this vision, the brazen statue which still crowns the castle was erected, and the building, as already stated, received the name by which it has since been distinguished. It has been long used as a public prison, and contains about four hundred wretched criminals, who have been sentenced to the galleys. The upper apartments, which present little worthy of notice, are used as prisons for the confinement of state criminals. In the principal saloon is exhibited a bust of Hadrian; and this apartment was used as a theatre for the representation of a tragedy during the fifteenth century. From the summit of the castle a fine view is presented of the windings of the Tiber; except for the purpose of ascending to the summit to enjoy this view, the interior of the castle is scarcely worth a visit.

As a fortress the castle of St. Angelo is now almost worthless. "Since the modern improvements in artillery," says Sir John Hobhouse, "it is clear that a castle, commanded as it is by all the neighbouring hills, could never resist a cannonade. It was surrendered during the late war in 1814, after an idle menace from the French captain that the angel on the top should sheathe his sword before the garrison would capitulate."

On Easter Monday there is a splendid display of fireworks from the castle of St. Angelo. Mr. Galiffe speaks of it in high terms. "If my expectations," he says, "were disappointed in the illumination [of St. Peter's], the fireworks far surpassed everything that I had ever seen or imagined. The signal for their commencement is given by a cannon-shot, a little after ten, which is instantly followed by the simultaneous explosion of three thousand sky-rockets, expanding in their flight in the form of a sheaf of corn. I had seen an explosion of fifteen thousand at once in the gardens of Peterhoff; but they did not produce the twentieth part of the effect of this one-fifth of their number, thus skilfully managed, and shooting upwards from the summit of the grand castle of St. Angelo. A beautiful cross-fire of all sorts of fire-works ensues, and the scene terminates with another flight of three thousand sky-rockets, similar to that with which it commenced. This certainly is the grandest exhibition of the kind that I have ever seen. The windows facing the castle, on the other side of the Tiber, are in great request on these occasions, and let at high prices.

REMAINS OF THE SEVEN HALLS OF VESPASIAN.

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KILLARNEY. No. VI.

DUNLOH CASTLE.

THE SHORES OF THE LOWER LAKE—THE TOWN OF KILLARNEY—THE CASTLE AND GAP OF DUNLOH.

ONE of the chief sources of attraction at Killarney is to be found in the very varied character of the scenery upon the borders of the body of water composing the two lower lakes,—Turk Lake and Lower Lake, as they are respectively called. Its southern and western shores are bounded by the lofty mountains which form so remarkable a feature of the county of Kerry, and which comprise among them the most elevated summits in all Ireland. Very different is the scenery on the other sides. The northern shore is bounded by hills of moderate height sloping gradually down to the water's edge. The part also of the eastern shore, lying contiguous to the northern, is bounded by similar hills; as is likewise that part of it which lies contiguous to the mountains of the southern shore. But throughout the remaining or middle portion of the eastern side, the hills recede considerably, so that for the space of about two miles, a low and level tract intervenes between them and the lake, instead of their coming down close to its waters. This level ground, in itself the least interesting part of the shores of Killarney, becomes of importance to the general effect of the scene, from the striking contrast it offers to the mountains, and the apparent increase it gives to their height.

To the southward this flat commences where the hills adjoining the peninsula of Mucruss terminate—that is to say, at Castle Lough Bay, as that great inlet is called which lies to the north of Mucruss peninsula, and forms the south-eastern corner of the Lower Lake. Near the head of the bay formerly stood the old fortress of Castle Lough on an insulated rock; it was a place of strength at least for its size, but was so completely demolished by the Parliamentary army under Ludlow, (whose capture of Ross Castle we recorded in a former number*,) that not a trace of it can be discovered, except a few fragments of walls scarcely discernible from the rocks on which they stand. The name of Castle Lough is at present given to a private demesne.

As far as the river Flesk, which enters the lake opposite the southern end of Ross Island, the flat forms a part of the demesne of Cahernane, an extensive and well-wooded place, described as interesting and possessing many advantages, notwithstanding

* See *Saturday Magazine*, Vol. XI., p. 195.

the level of the surface. The Flesk is crossed by a bridge over which runs the road to the town of Killarney, bordered by tall lime-trees. From the river Flesk to the road leading from the town to Ross Castle, the flat is occupied by small fields, bare of trees, and mostly divided by stone fences, and on the opposite side beyond the road, are the gardens and pleasure-grounds attached to the mansion of the Earl of Kenmare.

These pleasure-grounds are not, however, wholly on a low level surface. The flat ends at the little stream called the Deanagh, which, running from the north and passing almost close to the town, bends suddenly off and empties its waters into the lake. Beyond, or on the north of this river, the ground is diversified with gentle knolls covered with verdure, and adorned with some fine trees, beneath which there are walks commanding very charming prospects of the lake.

Upon the low flat which we have thus described as stretching inland for some distance from the eastern shore of the Lower Lake, stands the town of Killarney, about a mile from the water. It is comprised within the parish of the same name, in the barony of Magunihy, in the county of Kerry, and in the province of Munster; it lies to the south-west of Dublin, at a distance of 224 miles; its distance from Cork is only 45 miles. It boasts of two broad streets, called respectively the Old street and the New street, besides several smaller ones, more deserving of the appellation of lanes. The public buildings are not worthy of any particular notice. Mr. Wright mentions a public reading-room, to which strangers are politely invited by a singular announcement, to the effect that none but members or strangers are admitted. The mansion of Lord Kenmare, with its park and grounds, of which we have already spoken, adjoins the town, and generally attracts some of the attention of the visiter. The linen manufacture has made considerable progress under the patronage of the noble proprietor of the town, and the inhabitants derive great benefit from the visits of strangers during the Summer and Autumn.

The first object (says Mr. Barrow,) that catches the eye of the stranger on driving into the town, is the prodigious number of idlers lounging at every corner of the streets. The town itself, at least the main street, is pretty enough, but on either side the lanes and alleys have a dirty appearance, and the people strolling about were not at all prepossessing. There was stirring enough, however, as we drove up to the Kenmare Arms Hotel, where the coach stopped; here I found myself instantly surrounded, jolted, and jostled by a set of hungry-looking fellows, who all at once began to assail me with open mouths. One offered himself and his boat, the best in all Killarney,—another his pony to take me to the gap,—a third slily recommended the other two 'to get out of that, for *shure* the gintleman knows what he likes best,' and then confidentially whispering in my ear, —'Shure, your honour, mine's the best pony in the world to carry you to the top of Mangerton.' Escaping from this troublesome group comes a fellow directly in front, with his pockets full of divers-sized packets of Arbutus-seed, which he assures,—'there's niver the gintleman comes to Killarney that doesn't buy some to take home wid him.' Add to all these some dozen or two beggars, male and female, who fill up the outer circle, and the whole time chime in with their pious ejaculations, blessing, and praying, and preserving his honour's long life, and his honour's father and mother, and his wife and children; and these again are interrupted by a heap of ragged errand-boys, offering to go to the post-office for his honour's letters, or, in short, to do anything in the world for sixpence; and, lastly, come the pressing and polite invitations of the waiters of the respective inns, which, however, is not peculiar to Ireland. From this specimen you may form some slight idea of the hearty and welcome reception a stranger meets with on his arrival at Killarney.

The greatest inconvenience, however, chargeable upon Killarney, as Mr. Wright says, is the distance of the town from the lake. It was not possible to have fixed, in all the neighbourhood, upon a worse situation for the site of a village; the backs of the houses are turned towards the lake, the view of which is totally excluded by Lord Kenmare's woods, and but for the supply yielded by a few wells, there would not be any fresh water in the village, although there are rivers at a short distance on every side.

Not far from the town, two small rivers, the Deanagh and the Flesk, fall into the lake. If the town had been built at the mouth of either of these streams, and especially at the mouth of the latter, it would have enjoyed advantages of which it is now deprived, and visiters would have then had little ground of complaint. The inns in the town are generally crowded during the lake season. Mr. Barrow gives an amusing picture of the scene which one of them presented.

I had no sooner (he says) taken my seat in the coffee-room, than I found myself in the very midst of tourists. In one corner sat half-a-dozen noisy and merry looking fellows, clustered together, with an array of maps stretched out before them, talking over the exploits of the day, and making arrangements for the morrow. In another might be seen some solitary tourist (like myself), poring over a well thumbed "Guide to the Lakes," and ever and anon seeking information or explanation from the waiter. Some were busily employed with their knives and forks, in different parts of the room; while others were amusing themselves with reading over the names of the numerous visiters contained in the book that is kept for their insertion, and in which may be found what are intended for flashes of wit. I once peeped into this general consignment of experimental efforts of genius, and having discovered amongst some other equally valuable information, "that the *port* at the Kenmare Arms was," in the opinion of the writer, "finer than any *port* on the lakes," I felt satisfied, and hastily closed the volume.

On account of its low situation, as well as the intervening woods, the town of Killarney commands no prospect of the magnificent lake scenery; indeed, from no part of the flat in which the town stands, can any considerable portion of the lake be seen. But if the spectator advance inland across the flat and ascend the hills which bound it, he soon obtains some very charming views, perpetually varying in the most striking manner. The contrast between the confined glimpses obtained from the low plain and the broad expanding prospects which the rising hills command, will impress him with increasing force the higher he mounts. From that part of the flat which lies adjacent to the river Flesk, the small patches of the lake which he beholds appear like the windings of that stream. On ascending the rising ground, the wooded islands become more distinct; and the lake, instead of appearing like a dilution of the Flesk, rather wears the aspect of "a majestic navigable river, which received its tributary stream while rolling on through a spacious valley." Higher still on the hills, the view opens wider, and the actual form of the lake is fully displayed. From several positions on the hills, particularly from parts of the extensive deer park of Lord Kenmare, the prospect of the flat shore between the spectator and the water is effectually excluded by the trees on the slope beneath him; his eye therefore looking over his own wooded foreground, and lighting in the distance upon the woods of Mucruss on the one side, and those stretching along the western border of the lake to the river Laune on the other, he might imagine that the shores of the lake were covered with a vast forest from end to end.

The river Laune is the only outlet of the Lakes of Killarney, their superfluous waters flowing through its channel into the Atlantic at Dingle Bay. Its

source, or rather commencement, is at the north-western corner of the Lower Lake, whence it runs in a rapid course between the end of the hills on the northern bank, and the end of the vast mountain mass which lies on the western bank. Soon after leaving the lake it is crossed by a bridge; near which stands Dunloh Castle, the remnant of an ancient fortress, which seems to have been originally erected for the purpose of guarding the river, and a defile in the great chain of mountains. It stands on the summit of a small conical hill, whose apex has been cut away to afford a more convenient space for building; and its position must have rendered it, until the introduction of cannon into modern warfare, a place of great strength. It suffered considerably in the wars of the Earl of Desmond, during the reigns of Henry the Eighth and Queen Elizabeth; but it was rebuilt about the period of Sir George Carew's administration in Munster. Subsequently, when the forces of the Parliament came into this part of Ireland, the castle was again attacked, and a great part of it demolished by a bombardment. The only part of the edifice now standing is a square tower, which constituted but a small portion of the original fabric; this has been converted into a dwelling-house, "which affords more room and convenience than could be expected from the exterior aspect." Owing to the extraordinary thickness of the woods covering the hill upon which the building stands, no part of the lake or of the surrounding country is seen from the area in front of the castle, and even the windows afford but a very confined view; the battlements, however, command a noble prospect of the lake, and of the windings of the river Laune. Our engraving represents the castle as it appears from the banks of the river; in the distance appears the defile or opening in the mountains already mentioned.

This defile, which lies between Tomies Mountains and Macgillicuddy's Reeks, is called the Gap of Dunloh. The entrance is formed by the Holly Mountain and the Bull Mountain, which are shoots from the two larger masses above mentioned.

Amidst the vast mountainous region on the western side of the county of Kerry, there is no scene which exhibits a more varied and sublime combination of the boldest features of uncultivated nature than the Gap of Dunloh. By some terrific and mighty operation, the chain of mountains at this place seems to have been abruptly severed, and the stupendous rocks of which it was formed rent asunder and dispersed in wild disorder through the chasm. On the brow of the mountain which guards the entrance on the right hand, immense projecting masses of stone, suspended in their lofty beds, overhang the pass, threatening destruction to all who approach this savage solitude; and the vast fractured stones which are observable at the base of the cliff, plainly indicate that the danger has not always been imaginary.

One almost shudders at thinking of the horrible crash which must have been produced by these ponderous stones

> Tumbling all precipitate down dashed,
> Rattling round loud thundering to the moon,

whilst the echoes in the still of retirement repeated the tremendous sound through the windings of the vale. A clear stream at the bottom of the defile winds amongst the rocks,

> .....now rapid and now slow,
> Now murmuring soft, now roaring in cascades.

This stream forms a communication between a chain of small lakes, some of which are very deep, but others seem only to be a dilatation of the stream, where it has been obstructed in its course by the accumulated ruins of the impending precipice.

The entrance to the gap is very narrow; and the mountains on each side rise perpendicularly. At a short distance within is a little wild romantic glen, containing a small lake, the waters of which, from the shade cast upon them by the enormous mountain which hangs above, assume a peculiarly dark hue. As the visitor penetrates further into the defile, his admiration of the wild and savage scenery which surrounds him gradually gives way to a feeling of awe. At one point the defile becomes so narrow that there is space merely for the scanty road and the little dark gloomy lake beside it; on either side are steep precipitous crags, while in every direction are seen enormous masses which have been detached from the body of the mountains. Such, indeed, is the fearful sublimity of the pass at this particular spot, that instances have been known in which persons became so paralyzed with terror on reaching it, that nothing could induce them to advance further and brave the apprehension which had seized them, that the mountain might fall and overwhelm them. There are two small bridges thrown across the stream which runs through the defile, at the narrowest parts of the channel; they are of very simple though solid structure, and are in good keeping with the character of the scenery. One of them situated at the head of a cascade, and resting at each end on a single stone, has a very romantic appearance. The object of the bridge is to carry the road from one side of the defile to the other, where the obstacles on the former happen to be insurmountable. The road itself has been formed with considerable skill. In some places it passes along the edge of precipices where the way has been with difficulty cut through the solid stone; in others between immense detached rocks which have fallen from the mountain, and which are just sufficiently separated from each other to admit a single carriage, thus affording a natural passage that could not have been opened elsewhere without prodigious labour and expense. At one particular part of the pass the road runs along the margin of a black pool, "and is so unprotected as to inspire the equestrian traveller with fears that should his horse trip he might be precipitated into the lake."

But a scene of this description (says Mr. Wright), defies the address of the most expert tourist and the pencil of the ablest master: it must be seen to be understood. Those who have visited the passes of Borrowdale, in Cumberland, may form a faint idea of the chilling dreary grandeur of Dunloh; but the pass of Llanberris in North Wales, bears a still greater resemblance, and he who has seen the Gap of Dunloh will not be over-awed by the sublimity of Llanberris, nor will the deep-rooted image of Dunloh be eradicated by the combined beauty and grandeur of Borrowdale*.

The defile is three miles in length, and at the termination of it a view of the Upper Lake is to be had. It opens into the vale of Comme Duff, through which the road proceeds. Nearly opposite the termination of the gap is a beautiful waterfall of considerable height, and always plentifully supplied. The waters of this fall flow into a succession of small lakes, occupying the whole length of the valley; in some of these are islands bearing shrubs on their surface and decorated with water-lilies.

* "The scenery," says Sir R. C. Hoare, "is truly Alpine, and on a grand scale: the track rugged, but well worth the trouble of ascending. The horrors of the black surrounding rocks are much heightened by their reflections in the different lakes at their base. The scenery resembles that of the Pass of Llanberris under Snowdon in North Wales, but the vegetation amongst the rocks is much more luxuriant. This valley and pass afford many good subjects for the pencil, and are highly worthy the artist's attention."

It is the virtue of few words, to render plain that which thousands have obscured; as one glass will transmit a bright image of the sun, where hundreds produce but darkness and confusion.—Macculloch.

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY.

No. IX.

EARLY HISTORY OF MOSES.

MANY readers of the Bible are confused by finding the same name given to very different persons; in the earlier ages of the world proper names were not applied with the same regularity that they are now, titles of rank were frequently used in their place, and more especially the national titles of sovereigns. Pharaoh was the Egyptian designation of a king, and hence we find it given as the name of the monarch who received Abraham, of him to whom Joseph was minister, and of the foreign conqueror who so cruelly persecuted the Israelites. This usage has not quite disappeared; in works of modern history we find the term Sultan, employed to designate the ruler of Turkey, without the addition of his proper name; and the name of the Great Mogul similarly applied to the emperor of Delhi; and some writers omitting to mention changes in the succession have frequently led historical students into serious errors. To avoid such mistakes, we shall designate the Pharaoh who persecuted the Israelites, Pharaoh the Third, not because he stands third in the order of succession, but because he is the third mentioned in Holy Writ.

Pharaoh the Third found that the severe tasks he imposed on the Israelites did not prevent the continued increase of their numbers, "The people multiplied and waxed very mighty." (Exod. i. 20.) The tyrant, therefore, had recourse to the barbarous expedient of extermination, and ordered all the male children to be slain. Several sceptics have sneered at the improbability of such cruelty, though it is far from being without a parallel even in modern history. We have shown that Pharaoh the Third was the sovereign of an intrusive race of conquerors, whose position in relation to the native Egyptians and the Israelites was very similar to that of the Turks with respect to the Greeks and the Armenians. It is not generally known that, though Turkey in Europe contains more than eight millions of inhabitants, the Turks themselves do not amount to half a million, but their position as a dominant caste enables them to rule over fifteen-sixteenths of the population. Turkish sultans have been as much alarmed by the increase of their hostile subjects as Pharaoh the Third, and though they never have completely adopted his plan of extermination, they have sanctioned partial massacres, and more than once prepared to follow the system of destroying the Christian males to its fullest extent. When we read of the massacres perpetrated by the Spartans on the Helots, whenever the increase of their numbers rendered them formidable, we cannot doubt that a dominant caste, such as that which ruled Egypt under Pharaoh the Third, will hesitate at no act of cruelty, however atrocious, to ensure and continue its superiority.

In the midst of this cruel persecution Moses was born, and was concealed three months by his mother; when she could no longer hide him, "she took for him an ark of bulrushes," or as the words may more properly be translated, "a boat made out of the papyrus," and placed him by the brink of the river. The *papyrus* *, from which we have derived the word "paper," was anciently named *byblus*, and is the origin of the word "Bible," which properly signifies a paper book. It is called *al bardi* by the modern inhabitants of Egypt, who do not, however, pay any attention to its cultivation. But in the early ages no plant was more important; the soft pith was a common article of food, the stem supplied materials for small boats like canoes, and a variety of domestic utensils, while the inner rind of the plant, or, as some think, a certain preparation of the pulp, furnished materials for paper. It is well known that the byblus plant grows also in Europe, though only in one spot, namely, in the rivulet of Cyane, near the ancient city of Syracuse, in Sicily, but there it is produced in great abundance.

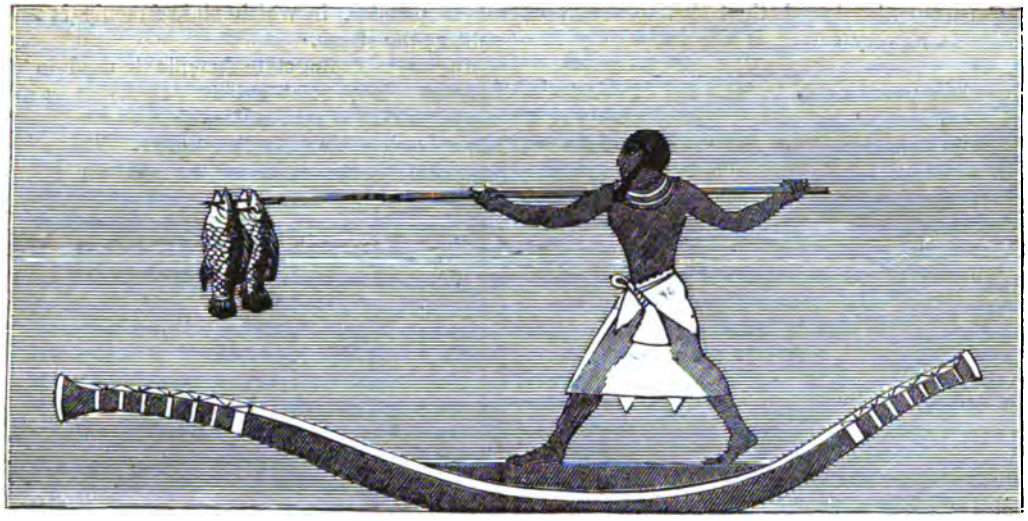
The *byblus*, or papyrus, grows in shallow water, and shoots out a stalk of nine or ten feet high; the trunk is composed of a number of long straight fibres, which produce small flowers; the leaves are like the blades of a sword, and are frequently used to keep wounds open; the ancient Egyptians employed the ashes of the root as a cure for sores, and attributed to it great healing powers. The length of the stalk, the natural hollow when the pulp was removed, and the ease with which it was worked, pointed out the byblus as a proper material for boat-building. Herodotus tells us that large boats were formed from planks cut out of the root, which is frequently fifteen feet in length; that the light stem furnished a mast, and the manufactured papyrus supplied ropes and sails. But the smaller boats, or canoes, were probably formed from the light stem, like the wicker cots which are now used on the Upper Tigris. There are many delineations of the Nile-boats on the monuments; some are evidently of very heavy burden, and are impelled both by ropes and sails: some are so small that they can only contain one person, who appears to be very careful in adjusting his equilibrium, lest he should overset the frail vessel. In the accompanying engraving the fisherman is represented in one of these boats, which seems to be particularly intended for shallow waters where fish might easily be speared.

The papyrus boat in which Moses was exposed, was daubed with slime and pitch,* that is, both with mineral and vegetable substances, to stop the chinks and keep out the water. A mineral tar, frequently employed for this purpose, is produced abundantly on the coasts of the Red Sea, and is so remarkable for its antiseptic properties, that it has been successfully applied to the manufacture of mummies. In the Museum of the Royal Asiatic Society of London, there is a human hand preserved by this mineral tar, so very perfect that the shape of the nails can be clearly seen. When the mother of Moses, therefore, had staunched the boat with this or some similar substance, she had reason to hope that it would float in safety, until some charitable person should take compassion upon the child. But in her immediate neighbourhood concealment was necessary, and "she laid it in the flags by the river's brink." From the monuments we find that the water-plants of the Nile, especially the lotus-lily, grew sometimes to such a height that they formed lurking-places for full-grown men. We see large nets for catching birds set in the marshes, watched by trappers who hide themselves in the lotus beds, and remain undiscovered until there is sufficient prey in the net. It is very probable that the sister of Moses availed herself of some such place of concealment, where she could watch the fate of the child without danger of detection.

"The daughter of Pharaoh came down to wash herself at the river;" we can find no examples of baths on the monuments, and it seems probable that ladies bathed as freely in the Nile as they now do in the Ganges.

When the daughter of Pharaoh beheld the weeping child, she had compassion on him and said, "This is

* See *Saturday Magazine*, Vol. IV. p. 208.



EGYPTIAN FISHERMAN IN A BOAT OF THE PAPYRUS.

one of the Hebrews' children." We find from the monuments that the Israelites were marked by the peculiar physiognomy which characterizes the Jews of the present day, so that the instant the princess beheld the child, she was quite certain of its parentage. This is one of the minute traits which at once stamps the authenticity of a narrative, for it is one which at the first glance seems improbable, but being confirmed by undesigned coincidence, becomes the very strongest corroborative evidence.

"She called his name Moses, (which signifies, drawn out); and she said, Because I drew him out of the water." The circumstance of naming persons from some striking peculiarity must be familiar to every reader of the Old Testament.

Though "Moses was instructed in all the wisdom of the Egyptians," we find that he never forgot his parentage. It is probable, that in spite of the exalted patronage he enjoyed, the courtiers of Pharaoh failed not to remind him that he belonged to a degraded caste. This, indeed, is evident from the reproach of the Israelite whom Moses reproved for injuring one of his brethren, "Who made thee a prince and a judge over us?" In this passage, the word translated *prince* more properly signifies *man*. Now, in almost every example of a dominant caste established in a country, we find its members exclusively arrogating to themselves the title of *man*, as if their inferiors were below the ordinary level of humanity. Indeed, our English title *baron*, simply signifies *man*, and was introduced at the time of the Conquest, when the Normans reduced the Saxons to a state nearly as degraded as that of the Israelites during their Egyptian bondage. Nothing more forcibly proves the miserable condition of the Hebrews, than the readiness with which this delinquent adopted the reproachful language of the oppressors, and denied the title of man to the most exalted of his own nation.

The reigning Pharaoh "sought to slay Moses;" an injury to one of a ruling caste is never forgiven. Were Pharaoh inclined to pardon Moses, it is probable that he would have found such an act of clemency beyond the limits of his power; even at this day, the sultan of Turkey would find it a very hazardous experiment to spare a Raya who had struck, much less slain a Turk.

Moses fled into the land of Midian. There are two countries known by this name in Scripture; one eastwards of the Asphaltic Lake, on the confines of Moab, the other which afforded shelter to Moses, on the Elanitic Gulf of the Red Sea. The inhabitants of the latter appear to have been a pastoral as well as a commercial race; they seem to have left the care of their flocks to women, which will account for the circumstance of the introduction of Moses to the daughters of Jethro. It may be added, that in this part of Arabia, the duty of attending the flocks is still regarded as a degrading employment by men, and generally falls on the female part of the population.

During the interval between the birth of Moses and his appearance before the sovereign of Egypt to claim permission for the children of Israel to go and worship God in the desert, the persecution of the Hebrews seems to have relaxed. A new Pharaoh most probably filled the throne, whose attention was not directed to the condition of his subjects in the land of Goshen until this application was made to him by Moses and Aaron. Pharaoh the Fourth revived the cruel policy of his predecessor: "Behold the people of the land now are many, and ye make them rest from their burdens." (Exod. v. 5.) The respite, however, was doomed to be of no long continuance, and the tyrant soon invented a new refinement of oppression. "Ye shall no more give the people straw to make brick as heretofore: let them go and gather straw for themselves." (Exod. v. 7.) Straw is not used in the modern manufacture of bricks, but anciently it was to connect and compact bricks dried in the sun. Bricks thus formed of straw and mud are still made in Egypt, and their ancient use is proved by the numbers found in the ruins of the brick pyramids.

Pharaoh the Fourth having thus deprived the labourers of the materials necessary for the manufacture in which they were engaged, insisted that they should still perform their allotted tasks. "And the tale of the bricks, which they did make heretofore, ye shall lay upon them; ye shall not diminish ought thereof: for they be idle: therefore they cry, saying, Let us go and sacrifice to our God. Let there be more work laid upon the men, that they may labour therein; and let them not regard vain words." (Exod. v. 8, 9.) The unfortunate Israelites were thus forced to undertake a new labour. "So the people were scattered throughout all the land of Egypt, to gather stubble instead of straw." (Exod. v. 12.) Many persons judging from our agricultural habits, might be led to suppose that Pharaoh required impossibilities; but as we have already observed in a former article of this series, the Egyptian reapers only cut off the ears of the corn, leaving the greater part of the stem untouched, so that the straw remained for

waste. Consequently, though the task imposed upon the Israelites was very severe, it was not wholly impossible.

The Israelites were unable to fulfil the double task, "And the officers of the children of Israel, which Pharaoh's task-masters had set over them, were beaten." (Exod. v. 14). This is a trait of government belonging to the oriental nations, both in ancient and modern times, but especially to such as have the misfortune to be ruled by a dominant caste. The Turk in the west of Asia, and the Mantchew Tartar in the remote east, make the stick the chief agent of administration. The highest officers of state are exposed to this infliction, which is never supposed to degrade the sufferer; on the contrary, we find many examples of viziers and nobles bastinadoed by order of their sovereign, for some slight offence or groundless suspicion, subsequently restored to favour and rank, without any one feeling that public punishment had weakened their respectability.

There are some who pretend to believe, that the accounts given by the sacred historian of the tyranny of the Pharaohs must be exaggerated; but the Fellahs of Egypt are, at the present day, subjected to oppressions similar to those described by Moses, and the remembrance of the Israelites is recalled to the mind of modern travellers, by the sufferings and the cruelties with which he is shocked at almost every step in that unhappy country.

ARSENIC.

ARSENIC is but rarely found in a state of purity. It commonly occurs in combination with the ores of cobalt, silver, lead, iron, and nickel. The minerals known by the names of *realgar* and *orpiment*, consist of Arsenic and sulphur in different proportions. The former of these native products seems to have been known to the ancients, and used by them in painting and for medicine.

Metallic Arsenic is exceedingly brittle, of a crystalline structure, and so volatile, that at a temperature of 356 degrees it is vaporised without melting. Its colour is a grayish-white, very much resembling that of polished steel, to which also its lustre bears a close analogy. This metal speedily tarnishes on being exposed to the action of air and moisture, its surface becoming covered with a film of black powder, which is sometimes superficial, whilst at other times it extends throughout the whole mass. It is said that some specimens of metallic Arsenic, which are supposed to have been in a state of extreme purity, have been kept for years in open vessels without losing their characteristic brilliancy.

Arsenic is highly inflammable, burning with a blue flame, and emitting fumes, the odour of which is very much like that of garlic. The Arsenic of commerce, commonly called *white Arsenic*, and by chemists *arsenious acid*, is a compound formed by the union of the metal with oxygen. The greater part of it is obtained from Bohemia and Saxony, where it is prepared by submitting the arsenical ores, with which those countries abound, to a strong heat in an oven, or reverberatory furnace, to which is attached a horizontal flue several hundred feet in length. In this flue the vaporised Arsenic is condensed, in the form of a dark gray powder, which is again heated, but in close iron vessels, when the impurities are separated, and the arsenious acid obtained in dense solid masses possessing a vitreous (glassy) lustre. By exposure to air, however, these semi-transparent masses gradually become opaque and fall into fine white powder, in which state Arsenic is commonly sold at the shops.

In its metallic state Arsenic is used in the arts, but not to any great extent. It forms an alloy with copper which is very malleable, and when plated with silver susceptible of a fine polish. This alloy enters into the composition of the specula of reflecting telescopes. Arsenic is also used in the manufacture of shot; a small quantity being mixed with the melted lead is found to impart to it the property of granulating in spherical drops. Arsenious acid is employed for purifying flint glass, whilst in a state of fusion, and for preparing colours used in painting. But for this latter purpose it is not so well adapted as the sulphurets of Arsenic already mentioned, namely, realgar and orpiment, to which we are indebted also for some very beautiful pigments used in dying and calico-printing.

Arsenic (arsenious acid) is one of the most virulent poisons with which we are acquainted, and as its cheapness renders it accessible to all classes, it has obtained an unfortunate celebrity by its frequent association with deeds of murder and suicide. Until very lately this dangerous substance has always been described as acrid and nauseous to the taste, producing a sharp burning sensation in the mouth and throat. This description is erroneous. Arsenic possesses hardly any taste, and what it has is sweetish, so that it is possible to swallow it without exciting suspicion or alarm. It is but slightly acted on by cold water, requiring four hundred times its own weight of that liquid for its solution. Of boiling water only thirteen times its weight is required; but on being permitted to cool the Arsenic separates from the water in the proportions just mentioned. Its solubility is greatly impaired by admixture with vegetable or animal substances, as coffee, tea, milk, and other similar materials.

Arsenic is very commonly used for destroying vermin, especially mice and rats, a practice which we think cannot be too strongly discountenanced, since it is never resorted too without considerable risk, and has often been attended by consequences the most unexpected and distressing. It is only a few months since that a poor boy lost his life by eating a piece of poisoned bread and butter, which had been incautiously left in an exposed situation as a bait for rats. And we know of numerous instances in which valuable animals have been destroyed whilst the vermin have escaped. Another objection to the use of Arsenic for the purposes just mentioned is, that it facilitates the means of obtaining it; thus placing it within the reach of persons who are too often excited by malice, revenge, or despair, and who, being familiar with its poisonous effects, resort to it as a ready instrument of destruction to themselves or the objects of their hatred. Hence it is that the number of deaths from poisoning by Arsenic, both by accident and design, very greatly exceed those occasioned by any other substance.

For medicinal purposes Arsenic has long been employed, but it requires to be administered with extreme caution, and in very minute doses; and its effects upon the system being vigilantly watched. In the hands of the ignorant or inexperienced it is scarcely possible to estimate the mischief it may produce; whilst under favourable circumstances it is acknowledged to be, for certain diseases, a safe and valuable remedy.

Arsenic is an active ingredient in several quack medicines. Let it be particularly noticed that *all* preparations containing Arsenic are poisonous; whether intended to be taken internally, or to be

applied externally in the forms of lotions, plasters, or ointment. In the latter case it kills more rapidly than when taken into the stomach. Hence the danger of using the various ointments and plasters which profess to be efficacious in the cure of cancer and other similar complaints An ointment containing only one part by weight of Arsenic to thirty-two of fatty matter, was applied to a cancerous wound, the surface of which did not exceed an inch and a half in diameter, for one night only. The day following, the patient, a girl of eighteen, was seized with vomiting and violent colic, and on the second day she died with all the symptoms of having been poisoned. If we thought it necessary, we could enumerate many instances in which the most lamentable effects have accompanied the use of quack medicines. By the combined efforts of ignorance, impudence, misrepresentation and avarice, the most deleterious nostrums acquire a temporary notoriety. Their inventors very frequently become rich; whilst death, or lingering disease, is the lot of many of their credulous and misguided patrons.

Referring again to the employment of Arsenic for the most wicked and detestable of purposes, namely, the destruction of human life; we wish distinctly to state, that it is now hardly possible for any person who resorts to it with criminal intentions to escape, sooner or later, from the ignominy and punishment their guilt justly merits.

The detection of deleterious and poisonous substances in cases of sudden or suspicious illness or death, constitutes an important branch of medical jurisprudence; and there is no substance whose presence can be more satisfactorily demonstrated, and which can be more easily separated from the contents of the stomach either before or after death, than that to which we here particularly allude. By a process, the details of which would not be interesting to our general readers, but which is of the utmost importance to the chemist, as it is also to the Christian philanthropist, so small a quantity as one-twentieth of a grain of arsenic has been collected from the stomach of a person who had been poisoned. Nor must we omit to mention the antiseptic properties of arsenic, by which we mean that it preserves from decay the bodies of those whom it deprives of life. Instances are well authenticated in which the stomach and intestines of persons who had died from the effects of arsenious acid have been found, after the lapse of many months and even of years, in as perfect a state as they were at the period of dissolution. Hence we remark that the grave, instead of concealing, may be the means of preserving, evidences of guilt; and the offender, when least suspecting it, may prove the truth of that solemn declaration, "Be sure your sin will find you out.'

The effect of Arsenic upon the human body is so sudden, that unless it is speedily expelled from the stomach, there are but faint hopes of recovery. The symptoms of having swallowed this poison are the occurrence within fifteen or twenty minutes of spasmodic pains of the stomach, a sensation of heat and tightness of the head and throat, and inflammation of the eyes. To these succeed vomiting and purging, with excruciating pain of almost every part of the body, but especially of the stomach, bowels, and head. Not a moment should be lost in procuring medical assistance, and, in the mean time, the best that can be done is to excite vomiting as quickly and as easily as possible.

We are not acquainted with any antidote for Arsenic. Lime-water and magnesia are usually recommended, but these substances tend rather to produce a temporary mitigation of suffering, than to neutralize the effects of the poison. Happily there have been instances in which, by skill and promptitude, life has been preserved; but when the first alarming symptoms have abated, it is a long time before the patient can be considered in a fair way towards recovery.

In an American journal (Silliman's) for May, 1836, two cases are mentioned, on the authority of Dr. Eastman of Holles, New Hampshire, U. S., in which tobacco had been employed with complete success in counteracting the usual effects of Arsenic. The first case occurred about the year 1820, and the subject of it was Sophia, the daughter of Dr. Eastman above mentioned, who ate, by mistake, some Arsenic which had been prepared for destroying rats. Painful symptoms soon led to inquiry, when the cause was immediately discovered. An elderly lady who was present, advised that the patient should be made to vomit as soon as possible, and as she had always felt a perfect loathing for tobacco, that herb was recommended as most likely to effect the desired purpose. A pipe was accordingly used, but as that did not produce nausea, Miss E. next chewed a large quantity of strong tobacco, and swallowed the juice. To the surprise of herself and her friends, this failed in exciting even a sensation of disgust; as did also a strong decoction made with hot water, of which she drank about half a pint. But not only was the tobacco ineffective, but the painful symptoms produced by the Arsenic gradually abated, and the patient began to feel well. Physicians soon afterwards arrived, when an emetic of blue vitriol (sulphate of copper) was administered, which operated moderately once. No ill consequences followed, and in a few days Miss Eastman fully recovered her health. The other case, which happened a few years afterwards in the same place, was that of a sick person, a female, who took arsenic by mistake, and she employed tobacco with the same success as already described. In this instance no emetic was taken, nor indeed any other remedy.

During the last few months, public attention has been directed towards a practice which seems to have prevailed to an alarming extent; we allude to the use of arsenic in the manufacture of certain kinds of candles. The merit of the disclosure is due, we believe, to a medical gentleman, who first mentioned the fact in a lecture delivered by him, last summer, before the *Medico-Botanical Society*. The subject has subsequently been very ably investigated by the gentleman already referred to, in conjunction with a committee, appointed expressly for the purpose by the *Westminster Medical Society*. By the report of this committee it is clearly shown, that candles containing arsenic are sold in very considerable quantities; that they are called by a variety of names*, each manufacturer giving them a different name; that they are represented by the parties interested in their sale as being very superior to tallow, and but little inferior to wax candles, yielding light greater in quantity, and purer in quality, than other candles; that they have platted, or, as they are sometimes called, metallic wicks, and require no snuffing. It has further been shown, that the quantity of arsenic (arsenious acid,) is found to vary considerably in different candles, and in different parts of the same candle, and that from 10 to 18 grains of this poisonous substance has been obtained from a pound weight of candles. The committee have examined

* These are "German Wax Lights," "Venetian Wax Candles," "Stearine Candles," "Imperial Wax," "Moulded Wax," "Tropical Wax Candles," &c. &c.

samples of almost every kind of candle they could procure, and in no instance has arsenic been found in "the true wax-lights, the true spermaceti, and the old-fashioned composition-candles."

The injurious effects of arsenic, when diffused through the atmosphere of an apartment in which candles containing it were burning, could never for a moment be doubted by those acquainted with its properties. To set the question before the public in the strongest possible light, the committee already mentioned have conducted, with great care, a series of comparative experiments, in which birds, rabbits, and guinea-pigs were placed in boxes, and exposed, under precisely similar circumstances, to the products arising from the combustion of an equal number of candles containing arsenic, and of others which were quite pure. Our space will not permit us to give the details of these experiments; but we must not omit to mention, that they are both interesting and important, as respects the public health. During the week that these experiments were pursued, seven birds which had been exposed to the vapour of arsenical candles died, whilst the birds in the boxes where pure candles had been burning, were as gay, and ate and drank as freely, at the end of the week as they did at its commencement.

We cannot pursue this subject further. Let us, however, express a hope, that the exposure which has taken place, may lead to the immediate abandonment of a practice fraught with consequences of so dangerous a character.

AMUSEMENTS IN SCIENCE.

No. VII.

ASTRONOMY.

IN many astronomical problems, the discovery of the meridian line, that is, a line passing exactly north and south, on any part of the earth's surface, is essentially necessary. When extreme accuracy is not required, the following plans are sufficiently correct.

Suppose the meridian line to be required for the purpose of constructing a sun-dial. Having firmly fixed a piece of brass or other substance, D E, fig. 1, in some place exposed to the sun, taking especial care that its surface is perfectly level and horizontal; and on the south side of this brass plate, fix a sharp-pointed piece of iron, A: take two squares, B and C, and place them as shown in the engraving; the point where

Fig. 1.

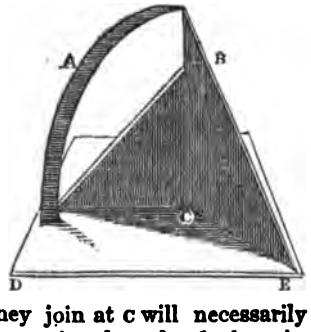
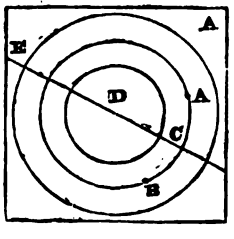


Fig. 2.



they join at C will necessarily be immediately under the pointed end of the wire; take this point as a centre and inscribe several concentric circles. Fig. 2 will explain this better. D is the point immediately under the point of the iron, and round this point several circles are drawn. An hour or two before noon mark the spot where the shadow of the iron point passes any of the circles; an hour or two after mid-day perform the same operation.

Let us suppose A and B the points on the *same* circle where the shadow crossed in the forenoon and the afternoon. Take the point C exactly midway between A and B, and from it draw a line through the centre of the circle at D. This line C D E is the meridian line of the place, and if care has been taken, its error will not be more than half a degree. The meridian line being once found, the construction of the sun-dial can be effected without difficulty.

IF two men are born on the same day and hour, and die on the same day and hour, one shall appear to have lived one or even two days longer than the other.

It is well known to all navigators, that if a ship sails round the world, going from *east* to *west*, those on board, when they return, will have counted a day less than the inhabitants of the country they have sailed from, and to which they have returned. The cause of this is, that the vessel following the course of the sun, has the days longer, and in the whole number of the days reckoned during the voyage, there is necessarily one rising and setting of the sun less, visible to the crew. On the other hand, if the ship proceeds round the world from *west* to *east*, as it goes to meet the sun, the days are shorter, and during the whole circumnavigation, the people on board necessarily count one revolution of the sun more.

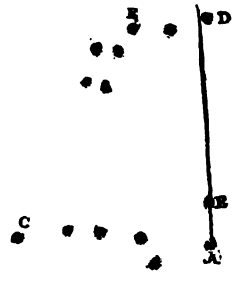
Supposing then, that of twin brothers one embarks on board a vessel which sails round the world from east to west and the other remains at home. When the ship returns, the inhabitants will reckon the day Thursday, while those on board the vessel will reckon it only Wednesday, and the twin who has been at sea will appear to have a day less in his life than he who has remained on shore. Consequently if they should die the same day, one of them would count a day less than the other, although they were both born on the same day.

But suppose that while one was sailing from east to west, the other went round the globe from west to east; on their return their account of the time would differ by two days,—one would appear two days older than the other.

THE Polar Star is nearly due north, and when neither sun nor moon are visible, and no mariner's compass at hand, it has directed the course of seamen across the trackless ocean, or been a guide to the wanderer on the land. Round this star the whole of the heavens appear to revolve. As it is not a peculiarly bright star, its beauty is not likely to attract notice, but it can be easily found by means of the splendid constellation of the Great Bear or Charles' Wain. This constellation is so extremely beautiful that it cannot fail to have been noticed by the most casual observer.

The following figure will show the method of finding the Pole Star by means of the Great Bear.

Fig. 3.



A B C represents this constellation. The two stars B and A are called the Pointers, and if a line is drawn through these in the direction of a smaller constellation, E, resembling the Great Bear in the arrangement of its stars, and known by the name of the Little Bear, the line will pass immediately under the Pole Star D. It is, as we have said, not very brilliant, but there are no stars of greater magnitude than itself within a considerable space of the heavens, for the remaining stars of the constellation of which it forms a portion, are much smaller, and only visible when the sky is particularly clear.

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JOHN WILLIAM PARKER WEST STRAND.

THE

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Nº 365. MARCH 10TH, 1838. {PRICE ONE PENNY.

THE ALBIGENSES. No. IV.

THE CASTLE OF MINERVE, IN LANGUEDOC.

CRUSADE UNDER SIMON DE MONTFORT AGAINST THE ALBIGENSES—CAPTURE OF MINERVE AND BARBARITIES COMMITTED BY THE PAPAL PARTY.

THE Castle of Minerve, situated at a short distance to the south-west of the town of St. Pons, in the South of France, was one of the strongest of the feudal fortresses which, in ancient times, so thickly covered that part of the country, and which have still left their ruins to impart a picturesque charm to its scenery at the present day. It was built upon a steep rock, surrounded by deep precipices, and from the advantages of its position was generally esteemed impregnable. It formerly gave the title of count and viscount to its possessors, and the adjacent district was called Minervois, after its name. Our engraving gives a view of the castle in its present state; the adjoining little village still preserves the name of Minerve.

In the days of its strength the castle of Minerve was a place of importance, and occupied a conspicuous station in the wars which at different times desolated the South of France. The most prominent feature, however, in its history is its capture by Simon de Montfort, during the crusade against the Albigenses, in the early part of the thirteenth century,—an event of considerable moment in the history of the crusade itself. In a former paper* we brought down the history of the persecution of the Albigenses to the period when the principal object of the first crusade against them had been accomplished by the capture of Carcassonne, in the month of August, 1209. All open resistance on their part was then at an end; but as the Pope's legate, Arnold Amabrie, Abbot of Citeaux, who had been foremost in preaching the crusade, and directing its operations, deemed the work of persecution to be yet incomplete, he conceived the diabolical design of rooting out the "pestilent heresy," by extirpating the enlightened people who had fostered it, and into whose homes he had already brought such dire calamities.

The legate's first measure was to call a council of the crusading chiefs, to provide for the disposition of the conquests which had been made by their united arms, in favour of some prince, who would undertake to complete the extermination of the Albigenses. The viscounties of Beziers and Carcassonne, whose lawful lord, Raymond-Roger, still languished in the prison to which the perfidy of Arnold had consigned him, were offered to Eudes the Third, the reigning Duke of Burgundy. This prince was one of the great lords who had engaged in this *sacred* war at

* See *Saturday Magazine*, Vol. XI., p. 97

the instigation of the monks of Citeaux; or, as a French historian of Burgundy expresses it, he had "taken the cross and joined the other lords, who, for the love of truth, and zeal for the Catholic religion, took arms to beat and destroy the Albigenses,—heretics so much the more dangerous, as they affected to follow an apostolic, penitent, and altogether disinterested life." But although the blind bigotry of Duke Eudes had led him, "for the love of truth," to make war upon the truth, he was not wanting in that sort of magnanimity and regard for justice with which knights and nobles were, or were supposed to be, inspired, in the age of chivalry. He refused the legate's offer of the territory of Raymond-Roger, saying, "That he had plenty of lordships and domains without taking that to disinherit the said viscount, and that it appeared to him that they had done him evil enough without despoiling him of his heritage."

The legate, however, was not long in finding a more pliant ally. He obtained from the council for himself, in conjunction with two bishops and four knights, full authority to settle the fate of the conquered lands; and then, in the name of this commission, offered them to Simon de Montfort, Earl of Leicester*, whose character is thus depicted by Sismondi.

This lord of a castle ten leagues from Paris, was the head of a house that had been illustrious for two hundred years, and which is traced by some to a natural son of King Robert. He had possessed the countship of Evreux, which, a few years before, he had sold to Philip Augustus; and his mother, who was an English woman, had left him, as an heritage, the Earldom of Leicester. He had distinguished himself in the fourth crusade, from which he was recently returned. Skilful as a soldier, austere in his carriage, fanatical in his religion, cruel and perfidious, he united every quality which could please a monk. He was too ambitious to refuse the offer which was made him, of elevating himself to the rank of the grand feudatories; but he still thought himself obliged to feign a refusal, very sure that they would overcome this pretended reluctance.

Simon de Montfort having accepted the proffered lands, proceeded to receive the homage of those among the vassals of the two viscounties, whom fear had inclined to submission, and brought to the camp of the crusaders; he also imposed on his new territories an annual tax payable at Rome, and issued severe decrees against all his subjects, who should not display an immediate and eager anxiety to free themselves from excommunication. In spite of the capture of Beziers† and Carcassonne‡, the two principal towns of the Albigenses, they were yet far from submitting to their persecutors, but continued bravely to hold out in the castles which abounded in the country. Many, too, of the crusaders departed from the army, their stipulated term of service,—forty days,—having expired.

Still however there remained a large force under the command of De Montfort, and after taking some castles he directed his arms against the Count of Foix, who, as well as the captive Viscount of Carcassonne, bore the name of Raymond-Roger. This count possessed the greatest part of Albigeois, which was regarded as peculiarly the seat of the new doctrines; and was even himself suspected of having secretly embraced them. Unable to contend with De Montfort, he offered to treat, after having sustained several reverses, and his antagonist deeming it politic to accept the offer, the active operations of the campaign of 1209 were, for a time, at an end.

Simon de Montfort now turned his attention towards securing himself in possession of the new states which he had acquired; and to effect that object he had recourse to a deed which has left upon his character one of the deepest of the stains disgracing it. He had observed, that although Raymond-Roger, the lawful sovereign of those states, was still allowed to be detained in prison, the hostility of many of the crusading chiefs against him was mitigated, and that, in fact, pity had succeeded in their minds to fury. The neighbours of that prince loved him; his people regretted him; and it was not impossible that his uncle and sovereign lord, the King of Arragon, might be disposed to interfere in his behalf. Accordingly De Montfort "gave the necessary orders that Raymond-Roger should die of a dysentery on the 10th of November, in a lower room of the viscountal palace at Carcassonne, where he was carefully guarded." Anxious however not to appear guilty of so heinous a crime, he displayed the body of the youthful prince to his subjects, and caused him to be buried with honour. But his efforts to conceal his villany were fruitless; the public voice accused him of having poisoned his captive.

The chief operations of the campaign of 1209 having been brought to an end, the crusaders deemed their task accomplished, and certainly they had ample reason to be satisfied with the extent of the enormities which they had committed. They had destroyed two large cities, they had slaughtered with the sword thousands of the sectaries, and compelled others to fly from their burning houses, and sink under the pressure of want in the forests and mountains. Of the princes who had excited their wrath, by wishing to maintain in their own dominions some liberty of conscience, one had perished in prison, two others had submitted, and "to make their peace, refused not their tribute to the fires of the inquisition," so that a daily sacrifice of human victims was offered up to the bigotry of these persecuting fanatics.

Sismondi observes, that those who had committed so many crimes were not, for the most part, bad men. They came from that part of Burgundy and Northern France where crimes have always been rare; but the heretics were in their eyes outcasts from the human race.

Accustomed to confide their consciences to their priests,—to hear the orders of Rome as a voice from heaven,—never to submit that which appertained to the faith to the judgment of reason,—they congratulated themselves on the horror they felt for the sectaries. The more zealous they were for the glory of God, the more ardently they laboured for the destruction of heretics, the better Christians they thought themselves.

Pope Innocent the Third, was the original instigator of the persecution of the Albigenses; and by his legates and emissaries, he "continually sharpened the sword of the murderers." The two Spaniards whom he sent into the province in 1204, and who helped to found the Inquisition, "first taught the art of seeking out in the villages those whom the priests were afterwards to fasten to their stakes." The spirit of fanaticism had been excited to frenzy by the monks over Europe. Germans came from the extremity of Austria to fight under the banners of the crusade; and the English monk, Matthew Paris, testifies to the zeal of our benighted countrymen in the same cause, and to their triumphant joy at "the miracle which had avenged the Lord," as he calls the massacre of Beziers.

The guilt, therefore, of the atrocities committed against the Albigenses, will not rest so heavily upon

* This name sounds familiar to English ears. The earl mentioned in the text was the father of that Simon de Montfort, Earl of Leicester, who usurped, as it were, the authority of the crown in the reign of Henry the Third, and terminated his ambitious career on the 4th of August, 1265, in the memorable battle of Evesham, which restored the sovereign power to its legitimate possessor.

† See *Saturday Magazine*, Vol. XI., p. 50.

‡ Ibid. Vol. XI. p. 97.

JOHN W. PARKER, Printer, 45, St. Martin's Lane.

the actual perpetrators as upon the subtle instigators of them; and as Sismondi remarks, it would be to destroy the only responsibility which rests upon the powerful, the only resort for the oppressed upon this earth, not to hold up to public execration the fanatical monks who directed this movement, and the ambitious who profited by it.

The vengeance of public opinion ought not to rest only upon those who accompanied the Crusaders in their expeditions, who dragged the reformers to the flames, and who mingled their songs of triumph with the groans of their miserable victims; these were, at least, blinded by the same mad passion with which they had inspired the combatants. There was something more personal, more deliberate, more coldly ferocious, in those clouds of monks who, issuing from all the convents of the order of Citeaux, spread themselves through the states of Europe, occupied all the pulpits, appealed to all the passions to convert them into one, and showed how every vice might be expiated by crime, how remorse might be expelled by the flames of their piles, how the soul, polluted with every shameful passion, might become pure and spotless by bathing in the blood of heretics.

Towards the close of 1209, the crusaders had experienced severe reverses, nearly all the castles which they had conquered having been surprised and recaptured; so that at the end of that year, the dominion of Simon de Montfort, in Languedoc, was reduced to eight cities or castles, it having previously comprised more than two hundred. During the ensuing Winter he remained on the defensive; but with the Spring came fresh clouds of fanatics, who enabled him again to take the field in force.

De Montfort began his attacks at once upon the castles, which existed in great numbers. Many of them were, however, abandoned on the approach of the crusaders, their possessors not deeming them capable of sustaining a siege. De Montfort generally caused all their inhabitants whom he could lay hands upon, to be hanged upon gibbets. Some castles, calculating too favourably upon their strength, endeavoured to resist him; that of Brom was taken by assault the third day of the siege, and Simon de Montfort chose out more than a hundred of its wretched inhabitants, and having torn out their eyes, and cut off their noses, sent them, in that state, under the guidance of a one-eyed man, to the castle of Cabaret, to announce to the garrison of that fortress the fate which awaited them. The castle of Alairac was not taken till the eleventh day; a great part of its inhabitants were able to escape from the ferocity of the crusaders, but De Montfort massacred the remainder. Further on he found castles abandoned and absolutely empty; and, not being able to reach the men, he sent out his soldiers to destroy the surrounding vines and olive-trees.

De Montfort then conducted his army to a more important and arduous task—the siege of the castle of Minerve, situated at a small distance from Narbonne, on a steep rock surrounded by precipices, and regarded as the strongest place in the country. The castle belonged to William à Guiraud of Minerve, a vassal of the Viscounts of Carcassonne, and one of the bravest knights of the province. The army of the crusaders appeared before Minerve at the beginning of June; the Legate Arnold, and the canon Theodise, joined it soon after. The inhabitants, among whom were many who had embraced the tenets of the Albigenses, defended themselves with great valour for seven weeks; but when, on account of the heat of Summer, the water began to fail in their cisterns, they demanded a capitulation, Guiraud came himself to the camp of the crusaders one day when the legate was absent, and agreed with Simon de Montfort on conditions for the surrender of the place. As they were proceeding to execute them, the Abbot Arnold returned to the camp, and De Montfort declared that nothing which they had agreed upon could be considered as binding, till the legate had given his assent.

At these words, (says Peter de Vaux-Cernay,) the abbot was greatly afflicted. In fact, he desired that all the enemies of Christ should be put to death, but he could not take upon himself to condemn them, on account of his quality of monk and priest.

With the view, however, of creating some dispute concerning the negotiation, and thereby causing all the inhabitants to be put to the sword, he required the two negotiators, De Montfort and Guiraud, to write down without communication the conditions to which they had agreed. As Arnold had hoped would be the case, he found some difference in the statements, of which De Montfort availed himself to declare, in the name of the legate, that the negotiation was broken off. But the knight of Minerve replied, that, though he thought himself sure of his memory, yet he would accept the capitulation as Simon de Montfort had drawn it up. De Montfort, however, referred the matter to the Legate Arnold, who settled the capitulation upon the following terms:—That the Lord Guiraud and all the Catholics in the castle, and even those who had favoured the heretics, should have their lives saved—that the castle should remain in the hands of De Montfort,—and that the "perfect heretics," of whom there was a considerable number, should have their lives saved if they would become converted. When the capitulation was read in the council of war,

Robert of Mauvoisin, (says the monk of Vaux-Cernay,) a nobleman entirely devoted to the Catholic faith, cried, that the pilgrims would never consent to that; for it was not to show mercy to the heretics but to put them to death, that they had taken the cross; but the Abbot Arnold replied—Fear not, for I believe there will be very few converted.

The anticipations of the legate proved well founded. The crusaders took possession of the castle of Minerve on the 22nd of July, 1210; they entered singing *Te Deum*, and preceded by the cross and the standards of Montfort. The "heretics," as they had been styled, were in the mean time assembled, the men in one house, the women in another, and there, on their knees, and resigned to their fate, they prepared themselves by prayer, for the torments that awaited them. The Abbot of Vaux-Cernay came in pursuance of the capitulation, and began to preach to them the Catholic faith; but his auditors interrupted him by a unanimous cry,—

We will have none of your faith, (said they,) we have renounced the church of Rome: your labour is in vain for neither death nor life will make us renounce the opinions that we have embraced.

The abbot then passed to the assembly of the women, whom he found equally resolute, and more enthusiastic in their declarations. The Count de Montfort, in his turn, visited both, having already piled up an enormous mass of dry wood: "*Be converted to the Catholic faith,*" said he to the assembled Albigenses, "*or ascend this pile.*" None, however, were shaken. Fire was then applied to the pile, and the whole square being soon covered with a tremendous conflagration, the victims were conducted to it. Violence, however, we are told, was not necessary to compel them to enter the flames; they voluntarily precipitated themselves therein to the number of one hundred and forty, after having commended their souls to God.

These martyrs (says the historian Milner,) died in triumph, praising God that he had counted them worthy to suffer for the sake of Christ. They opposed the legate to

his face, and told Simon that on the last day, when the books should be opened, he would meet with the just judgment of God for all his cruelties.

Three women only recanted; they were forcibly held back by the noble lady of Marly, the mother of Bouchard, Lord of Montmorenci; terror and consternation succeeded to the enthusiastic fervour which had hitherto supported them, and consenting to be converted, they were saved from the flames.

AMUSEMENTS IN SCIENCE.

No. VIII.

GEOMETRY.—Part 5.

To draw a right angle without any other instrument than a straight stick and two or three pegs. Draw the straight line F A C B, and make F A, A C, and C B, equal to each other; from C draw the straight line C D *d* in any direction, make C D equal to C A, and draw the line D *h* through the point A, draw the line F G, through any part of D *h*, and make E G equal to E F. The point G will then be exactly perpendicular to A, and the line G A, when drawn, will be at right angles with A B, and consequently the angle A is a right angle.

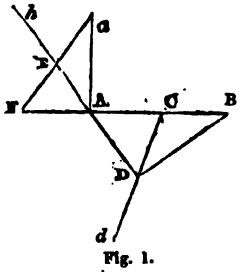


Fig. 1.

To measure the superficial contents of a rectangular piece of ground. Suppose A B to be equal to twenty feet, and C B to nine feet; multiply twenty by nine, which produces one hundred and eighty; this would be the contents of the square plot of ground A B C D, and consequently, the contents of the triangular plot would be equal to one-half one hundred and eighty, namely, ninety feet.

Fig. 2.

A BRICKLAYER had to construct a wall whose length in the direction A B C was twenty-four feet. The one-half of this wall, namely, from B to C, had to be built

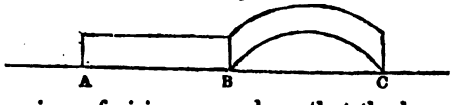


Fig. 3.

over a piece of rising ground, so that the base of this part of the wall would necessarily be more than twelve feet. In making out his account he charged more for this half of the wall than for that which was built on level ground from A to B. A geometrician assured him that the square contents of both portions of the wall were exactly alike, which may be proved in this manner. Cut two pieces of card-

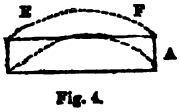


Fig. 4.

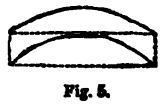


Fig. 5.

board in the form shown in figs. 4 and 5, to represent the two parts of the wall; lay the piece representing the straight wall on the curved piece, and it will be found that the angles which project at A and B will exactly fill up the spaces at E and F. The piece of pasteboard representing the straight wall, may thus be proved to be exactly sufficient to form a piece equal to that representing the curved wall. You may then lay the curved piece upon the straight one, and reversing the experiment, prove that the curved piece is capable of forming a rectangular piece equal to the other.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT.

No. I.

A POPULAR DESCRIPTION OF THE ORGANS OF SIGHT.

MAN in his present temporary position on the globe, is subject to all the physical laws which, under the direction of a superintending Providence, govern the universe. He is endowed with certain perceptions, by whose means alone, he communicates with the exterior world and acquires all his knowledge. These perceptive faculties are admirably fitted for use in the strict sense of the word, and it seems to be a law of nature, as rigid as it is grand and beautiful, that the natural laws are self-acting; that is, they bear with and inflict of themselves their own penalties. If, for example, we exceed the use of any one faculty; so soon as the use intended by nature is exceeded, the abuse of the faculty begins, and then also the penalty attached to the law of nature, which regulates the use, begins. Pain is the most apparent symptom of abuse, and usually accompanies it; but the most awful, and awful because mysterious, operation of the penalty is, the slow and premature loss of the use of the faculty either in part or wholly: the faculty then ceases to act; and its possessor, because he has abused one of nature's gifts, is deprived of it.

And here there is no court of appeal: it is useless to urge ignorance of the powers of the faculty, since nature began by inflicting her penalty by slow degrees, either by imparting to the possessor small increments of pain, or partial deprivation of the power of the faculty, so as to urge, as it were, upon the owner, gently, and in her own beautiful way, the necessity of complying with those laws which never vary, by chiding him for being so hard a taskmaster as to exact from a faithful servant a task which it was never calculated to supply.

Many of the arts of life furnish employments which injuriously affect the faculties of those employed in them: what these pursuits are, and how they operate, is a curious and instructive inquiry, into which, as far as respects the organ of sight, we are now about to enter, with the hope that our readers generally will find it useful, and some of them in particular will, we doubt not, find the subject one of more than common interest as it affects themselves peculiarly. We shall point out how, in many employments, the faculty of vision is injuriously affected or abused, and the simple and practicable means of removing the abuse. We select the organ* of sight as being probably the most extensively useful of all our faculties, and the one most liable to abuse.

We propose, in order to the due comprehension of our present subject, to describe the organ and function of the eye somewhat fully; and as many of the visual imperfections to be hereafter described are the results of the writer's own personal experience, the present paper may be considered partly as an exposition of the writer's own visual defects, and also how such defects may be traced to a large variety of causes more or less energetic in their action, but whose proximate operation is nearly the same.

1. The eye, which, from the wonderful power of its exterior expression, and the exquisite beauty of its internal arrangements, is said to be "Nature's masterpiece," is a globular structure placed within an orbit, or funnel-shaped cavity, on one side of the root of the nose and under the arch of the forehead. The

* We may here state, that an organ is the physiological arrangement of parts through which the function, or work done by the organ, acts. Thus the eye is the organ of sight; seeing, therefore, is the function. The ear is the organ of hearing, and hearing the function, &c.

eye-ball is a little smaller than this socket or orbit, to allow of free motion in every direction: this motion is effected by means of a muscular arrangement attached to the white of the eye, and the motion is rendered easy, and at the same time the eye is defended from injury or compression in its motion, by a quantity of fat which in health is secreted in the orbit, forming several soft cushions on which the globe of the eye rests. When this fat is absorbed by any emaciating disease, the eye sinks within its socket, and a person is then familiarly termed "hollow-eyed." The eye itself is composed chiefly of three humours (one of which is solid and the others fluid), and four membranous coats or tunics: the humours completely fill the eye, and give it its shape, and at the same time support the membranous coats. The white of the eye, or the *sclerotica*, so named from its hardness, is the exterior coat, and forms the whole of the outer eye-ball, with the exception of about one-fifth, which latter space is occupied by the *cornea*, (so called from its *horny* texture,) a transparent shield placed in front of the eye, through which the rays of light pass uninterruptedly. The cornea receives its lustre and polish from the eyelids, which are constantly engaged in folding over it; and our readers will doubtless call to mind that one of the first acts of the cold though active hand of Death, is to dull the transparency of this beautiful convex mirror, which reflects all objects presented to it; while life, health, and youth, preserve its properties unimpaired. The tendency of age is to flatten the cornea, and to diminish its transparency and polish; hence, it is said, that the eye of age is dim; and by a converse application the eye of youth is said to be lustrous, sparkling, beaming, &c., since in this case the cornea is a convex mirror, whose polish reflects light from its surface, while its transparency transmits light into the eye for the purposes of vision.

The white of the eye is lined internally with a membrane of a more delicate structure, called the choroïd coat, or tunic, which is covered with a black non-transparent pigment, placed there for the purpose of absorbing the rays of light when the purpose of vision has been served. Within the choroïd coat is the *retina*, (so called from its reticulated or net-like structure,) which is a very delicate membrane, formed from the expansion of the optic nerve, which enters the eye at a point nearly opposite the pupil. In the centre of the retina there is a small spot surrounded with a yellow margin; this spot is miscalled the *foramen centrale*, or central hole; for it is not a hole but a spot; and it is remarkable, that while the whole of the retina receives upon itself the images of external objects, and is highly susceptible of luminous impressions, the foramen centrale is incapable of luminous excitation by means of light of ordinary intensity, and it does not, as far as we know, assist the visual powers of the eye.

Behind the cornea we find a coloured membrane drawn across the eye; this membrane is called the *iris*, (a Latin word for the rainbow,) and is the distinguishing feature by which the colour of eyes is determined, its anterior surface being in some animals richly and variously coloured. The iris is perforated nearly in its centre by the pupil*, which is a hole for the admission of light into the interior chambers of the eye; and it is a fact no less extraordinary than beautiful, that the iris is furnished with a self-adjusting apparatus, to which there is no parallel throughout the whole of human invention, by means of which the pupil is contracted or enlarged, according as light is more or less abundant. In man this apparatus seems to be self-acting, and not to depend upon the will, except in a few rare cases, where individuals have been known to possess the power of spontaneously regulating the motions of the iris; but this power, like that by which a very few persons have been able to move about the outer ear, after the manner of some of the lower animals, seems lost to the great bulk of mankind. It will doubtless have been noticed, that on quitting a well-illumined room, where the pupil is small, that is, in its contracted state, in consequence of the abundant presence of light, and going out into a dark street, we are apt, at first, to suppose that the night is more than usually obscure; but, as we proceed, objects become more and more visible, and we are apt to exclaim, "It is not so dark as it was!" while, in all probability, the change, if any, is in the observer's own eye, since the fibrous arrangement which regulates the motions of the pupil, being relieved from the stimulus of a large quantity of light, gradually relaxes, and allows the pupil to expand, so as to admit as much light as possible in the obscure situation into which we now suppose it is transferred. It is believed that the motions of the pupil in the eyes of feline animals, such as cats, &c., and animals of prey generally, are voluntary; that is, they are regulated by the will of the animal, and serve the purposes of sudden and extraordinary adjustment, which may be required by the animal while engaged in its nocturnal pursuit after food.

The iris divides the interior globe of the eye into two very unequal parts, or chambers; that before the iris is called the *anterior chamber*, and contains a limpid colourless liquid, called the *aqueous humour*, from its similarity to water, and the space behind the iris (which has been called the *curtain of the eye*, from the beautiful manner in which it seems to fold and unfold), is named the *posterior chamber*, and contains a small hard double convex lens, called the crystalline lens, (from its resemblance to crystal;) and the *vitreous humour* (from its similarity to molten glass), which completely fills up all the rest of the eye.

The crystalline lens in its posterior, and most convex face, is exactly fitted to a concavity in the forepart of the vitreous humour; it is said to be enclosed in a transparent bag, called a capsula, and it is surrounded by what are termed the ciliary processes, which form an opaque circle round the lens, and impede all rays which might otherwise be transmitted by its side: the lens itself is composed of triangular pieces, which in their turn are formed of concentric scales. The substance of the lens increases in density: that is, its structure becomes more compact from the circumference to its centre, for the purpose of correcting what is called its spherical aberration †. The form of this lens varies in different animals according to their habits and places of abode. In the eye of the cod-fish it is spherical, and such of our readers as have seen a boiled cod's-head at table, will probably have noticed a white opaque ball in the eye of the animal; this is the crystalline lens of the cod-fish, which containing albumen, becomes of an opaque white, similar to the white of egg (which is almost pure albumen) when subjected to the heat of boiling water.

The vitreous humour occupies the whole of the space between the crystalline lens and the retina. This humour is contained within cells, and resembles

* The Latin word *pupilla* signifies the ball, the apple or sight of the eye.

† The object of spherical lenses is to converge the rays of light to a point or focus, but in practice it is found that the rays deviate somewhat from this point, and this deviation is called spherical aberration; the latter term implies a wandering or straying. Two causes are assigned to this phenomenon; 1st, the form of curvature of the lens; 2nd, the different refrangibilities of different rays of light.

(to use a rough analogy) honey contained in the cells of the honeycomb: this humour and the cells which contain it are both transparent.

Having thus pointed out the principal parts of the eye and their uses, we may briefly allude to a few external appendages of the same organ. The bony projection of the eyebrows forms a sort of arched abode for the eye, to shield its delicate tenant from external violence, and from too much light; and, like a projecting roof, the brow is furnished with a ridge of hairs, the eyebrows, which arrest or entangle any small substances, solid or fluid, which might otherwise fall or trickle upon the eye. The eyelids, or semi-oval curtains which cover the great aperture of the orbit, graduate the light falling upon the eye by the extent of their separation, or exclude it when they are closed, although to a small extent light does enter at the line of junction of the two lids. The eye-lashes are hairs which border the edges of the lids, arranged in three or four rows. Their direction is curved; those from the upper lid proceeding upwards, and those from the under lid downwards. Their length and fulness varies in different individuals; their colour is generally that of the eyebrow, and their purpose is that of an additional screen to the eye. The lachrymal ducts in which tears are secreted, in their usual healthy and natural state, supply the eye with moisture, which is spread over its surface by means of the eyelids: these ducts are situated a little within the nose.

REVOLUTIONS OF THE SEASONS.

. . . . . I solitary court
The inspiring breeze, and meditate upon the book
Of nature, ever open; aiming thence,
Warm from the heart, to learn the moral song.

PERSONS of reflection and sensibility contemplate with interest the scenes of nature. The changes of the year impart a colour and character to their thoughts and feelings. When the seasons walk their round, when the earth buds, the corn ripens, and the leaf falls, not only are the senses impressed, but the mind is instructed; the heart is touched with sentiment, the fancy amused with visions. To a lover of nature and of wisdom, the vicissitude of seasons conveys a proof and exhibition of the wise and benevolent contrivance of the Author of all things.

When suffering the inconvenience of the ruder parts of the year we may be tempted to wonder why this rotation is necessary,—why we could not be constantly gratified with vernal bloom and fragrance, or Summer beauty and profusion. We imagine that, in a world of our creation, there would always be a blessing in the air, and flowers and fruits on the earth. The chilling blast and driving snow, the desolated field, withered foliage, and naked tree, should make no part of the scenery which we would produce. A little thought, however, is sufficient to show the folly, if not impiety, of such distrust in the appointments of the great Creator.

The succession and contrast of the seasons give scope to that care and foresight, diligence and industry, which are essential to the dignity and enjoyment of human beings, whose happiness is connected with the exertion of their faculties. With our present constitution and state, in which impressions on the senses enter so much into our pleasures and pains, and the vivacity of our sensations is affected by comparison, the uniformity and continuance of a perpetual Spring would greatly impair its pleasing effect upon our feelings.

The present distribution of the several parts of the year is evidently connected with the welfare of the whole, and the production of the greatest sum of being and enjoyment. That motion in the earth, and change of place in the sun, which cause one region of the globe to be consigned to cold, decay, and barrenness, impart to another heat and life, fertility and beauty. Whilst in our climate the earth is bound with frost, and the chilly smothering snows are falling, the inhabitants of another behold the earth first planted with vegetation and apparelled in verdure, and those of a third are rejoicing in the appointed weeks of harvest.

Each season comes attended with its benefits, and beauties, and pleasures. All are sensible of the charms of Spring. Then the senses are delighted with the feast that is furnished on every field and on every hill. The eye is sweetly delayed on every object to which it turns. It is grateful to perceive how widely, yet chastely, nature hath mixed her colours and painted her robe; how beautifully she hath scattered her blossoms and flung her odours. We listen with joy to the melody she hath awakened in the groves, and catch health from the pure and tepid gales that blow from the mountains.

When the Summer exhibits the whole force of active nature, and shines in full beauty and splendour, when the succeeding season offers its purple stores and golden grain, or displays its blended and softened tints; when the Winter puts on its sullen aspect, and brings stillness and repose, affording a respite from the labours which have occupied the preceding months, inviting us to reflection, and compensating for the want of attractions abroad by fire-side delights and home-felt joys. In all this interchange and variety we find reason to acknowledge the wise and benevolent care of the God of the seasons. We are passing from the finer to the ruder portions of the year. The sun emits a fainter beam, and the sky is frequently overcast. The garden and fields have become a waste, and the forests have shed their verdant honours. The hills are no more enlivened by the bleating of flocks, and the woodland no longer resounds with the song of birds. In these changes we see evidences of our instability, and images of our transitory state.

So flourishes and fades majestic man.

Our life is compared to a falling leaf. When we are disposed to count on protracted years, to defer any serious thoughts of futurity, and to extend our plans through a long succession of seasons, the spectacle of the fading, many-coloured woods, and the naked trees, affords a solitary admonition of our frailty. It should teach us to fill the short year of life, or that portion of it which may be allotted to us, with useful employments and harmless pleasures; to practise that industry, activity, and order, which the course of the natural world is constantly preaching.

Let not the passions blight the intellect in the spring of its advancement, nor indolence nor vice canker the promise of the heart in the blossom. Then shall the summer of life be adorned with moral beauty, the autumn yield a harvest of wisdom and virtue, and the winter of age be cheered with pleasing reflections of the past, and bright hopes of the future.—*Monthly Anthology*

THE works of nature, and the works of revelation, display religion to mankind in characters so large and visible, that those who are not quite blind may in them see and read the first principles and most necessary parts of it, and from thence penetrate into those infinite depths filled with the treasures of wisdom and knowledge.—LOCKE.

ON THE PLEASURE OF ACQUIRING KNOWLEDGE.

In every period of life, the acquisition of knowledge is one of the most pleasing employments of the human mind. But in youth, there are circumstances which make it productive of higher enjoyment. It is then that everything has the charm of novelty; that curiosity and fancy are awake; and that the heart swells with the anticipations of future eminence and utility. Even in those lower branches of instruction which we call mere accomplishments, there is something always pleasing to the young in their acquisition. They seem to become every well educated person; they adorn, if they do not dignify humanity; and, what is far more, while they give an elegant employment to the hours of leisure and relaxation, they afford a means of contributing to the purity and innocence of domestic life.

But in the acquisition of knowledge of the higher kind,—in the hours when the young gradually begin the study of the laws of nature, and of the faculties of the human mind, or of the magnificent revelations of the Gospel, there is a pleasure of a sublimer nature. The cloud, which in their infant years, seemed to cover nature from their view, begins gradually to resolve. The world in which they are placed, opens with all its wonders upon their eye; their powers of attention and observation seem to expand with the scene before them; and, while they see, for the first time, the immensity of the universe of God, and mark the majestic simplicity of those laws by which its operations are conducted, they feel as if they were awakened to a higher species of being, and admitted into nearer intercourse with the Author of Nature.

It is this period, accordingly, more than all others, that determines our hopes or fears of the future fate of the young. To feel no joy in such pursuits; to listen carelessly to the voice which brings such magnificent instruction; to see the veil raised which conceals the counsels of the Deity, and to show no emotion at the discovery, are symptoms of a weak and torpid spirit,—of a mind unworthy of the advantages it possesses, and fitted only for the humility of sensual and ignoble pleasure. Of those, on the contrary, who distinguish themselves by the love of knowledge,—who follow with ardour the career that is open to them, we are apt to form the most honourable presages. It is the character which is natural to youth, and which, therefore, promises well of their maturity. We foresee for them, at least, a life of pure and virtuous enjoyment; and we are willing to anticipate no common share of future usefulness and splendour.

In the second place, the pursuits of knowledge lead not only to happiness but to honour. "Length of days is in her right hand, and in her left are riches and honour." It is honourable to excel even in the most trifling species of knowledge, in those which can amuse only the passing hour. It is more honourable to excel in those different branches of science which are connected with the liberal professions of life, and which tend so much to the dignity and well-being of humanity. It is the means of raising the most obscure to esteem and attention; it opens to the just ambition of youth, some of the most distinguished and respected situations in society; and it places them there, with the consoling reflection, that it is to their own industry and labour, in the providence of God, that they are alone indebted for them. But, to excel in the higher attainments of knowledge,—to be distinguished in those greater pursuits which have commanded the attention, and exhausted the abilities of the wise in every former age,—is, perhaps, of all the distinctions of human understanding, the most honourable and grateful.

When we look back upon the great men who have gone before us in every part of glory, we feel our eye turn from the career of war and of ambition, and involuntarily rest upon those who have displayed the great truths of religion, who have investigated the laws of social welfare, or extended the sphere of human knowledge. These are honours, we feel, which have been gained without a crime, and which can be enjoyed without remorse. They are honours, also, which can never die,—which can shed lustre upon the humblest head,—and to which the young of every succeeding age will look up, as their brighest incentives to the pursuit of virtuous fame.——Alison.

THE FEATHER OF A PEACOCK.

In its embryo the feather of a peacock is little more than a bladder containing a fluid, while every one knows the general structure of those long ones which form the train. The star is painted on a great number of small feathers, associated in a regular plane; as those have found their way from the root, through this long space of three feet, without error of arrangement or pattern, in more millions of feathers than imagination can conceive. If this is sufficiently wonderful, the examination of each fibre of this canvass (to adopt this phrase,) will much increase the wonder. Taking one-half of the star, the places and proportions of the several colours differ in each of those, as do their lengths and obliquities, yet a single picture is produced, including ten outlines, which form also many irregular yet unvarying curves. And, further, the opposed half corresponds in every thing; while this complicated picture is not painted after the texture is formed, but each fibre takes its place ready painted, yet never failing to produce the pattern. If this is chance, the coloured threads of a tapestry might as well unite by chance to produce a picture; while every annual renewal is equally accurate, as it has been in every such animal since the creation. And whatever the other chances may be, enormous as they are against the hypothesis, this further number cannot be evaded, because it would be to abandon the very principle of chance, to say that renewal, or perpetuation, were governed by laws. If the system is to mean what it pretends to do, every feather that ever existed must have been the result of fortunate chances. This would be enough, had this object not demanded the arithmetical calculation; for, omitting all else, who would even hope to reproduce the star from the same separated materials, under any number of chances?

But the entire analysis I need not make in words; it can be done by any one on the subject itself, and with a more satisfactory effect. Let him take each fibre separately, note the number of the colours, their gradations, the very different modes of those on the different fibres, and the very different places of those colours on them, with the still more remarkable differences in those fragments of the many outlines included in the star. The painter, who best knows the difficulty of producing gradations on even a fixed plane, will best also conceive the impossibility of producing, under any number of chances, such a coloured plane, from a hundred separated fibres previously painted, or even of thus producing the much easier outlines.

But who will compute this unwieldy sum? The result alone, the figures expressing the chances against one, that this little object was not the pro-

duce of chance, would fill a page; it is equivalent to infinitude against one. Suffice it here, that I inquire of the probability of simply replacing, by chance, the disarranged and intermixed fibres of the star in their original places or order; while, even then, I need not take more than the half, as the result of the total is equally unnecessary and unwieldy. It would be a purposeless parade of arithmetic to detail those figures; if the reader will place a unit before sixty-four zeros, he will have a sufficient conception of these chances for the present purpose. And chances far short of this have ever been held competent to any proof.

[MACCULLOCH *on the Attributes of God.*]

THE MANUFACTURE OF GUN-FLINTS.

THE art of forming Gun-flints was formerly kept a profound secret, at least in France and Germany. The kind of stone employed, is that species of silex, or flint, which is found in irregularly shaped lumps in the chalk formations of the earth.

The masses of flint which are best fitted for the purpose, consist of those of a convex surface, approaching to globular, the knobbed and branched flints being generally full of imperfections. The best flint nodules are in general from two to twenty pounds in weight; they should be unctuous, or rather shining, internally, with a grain so fine as to be imperceptible to the eye. The colour should be uniform in the same nodule, and may vary from honey-yellow to a blackish-brown; it is necessary that the fracture should be smooth and equal, and somewhat conchoidal, hollowed like a shell, and should be partially transparent at the thin edges.

Four tools are necessary in the manufacture of

Fig. 1.

Fig. 2.

flints. 1. An iron hammer, fig. 1, with a square head, not more than two pounds in weight, and seven or eight inches in length: 2. a hammer of well-hardened steel, fig. 2, with two points, a handle seven inches long, and from ten to sixteen ounces in weight: 3. a disk hammer, or roller, fig. 3, like a solid wheel or

Fig. 3.

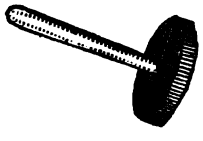


Fig. 4.

cylinder, two inches and one-third in diameter, and not exceeding twelve ounces in weight; it is made of steel not hardened, and has a handle six inches long. 4. a chisel, fig. 4, tapering and bevelled at both ends, which should be made of steel not hardened, six, seven, or eight inches long, and two inches wide. With these tools the flints are formed in the following manner:—

The workman, seated on the ground, places the nodule of flint on his left thigh, and applies slight strokes with the square hammer to divide it into smaller pieces of about a pound and a half in weight, with broad surfaces and an almost even fracture. He then holds the piece of flint in his left hand, not supported, and strikes with the pointed hammer on the edges of the great planes produced by the first breaking, by which means the white coating of the flint is removed in the form of small scales, and the mass of flint itself laid bare, as shown in fig. 5; after

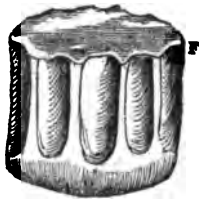
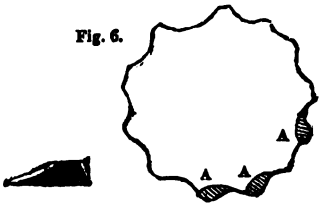


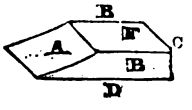
Fig. 5.

Fig. 6.



this he continues to chip off similar scaly portions from the pure mass of flints as A A A, fig. 6, which is a cross section or plan of fig. 5, the shaded portions showing the points removed at each blow. These portions are nearly an inch and a half wide, two inches and a half long, and their thickness in the middle is about one-sixth of an inch: they are slightly convex below, and consequently leave in the part of the flint from which they are separated, a space slightly concave, longitudinally bordered by two rather projecting straight lines or ridges. These ridges produced by the separation of the two scales, must naturally constitute nearly the middle of the subsequent piece; and such scales alone as have their ridges thus placed in the middle are fit for gun-flints. In this manner the workman continues to split or chip the mass of flint in various directions, until the defects usually found in the interior, render it impossible to make the fracture required, or until the piece is reduced too much to be easily broken.

To shape the gun-flint out of these scales, he selects such only as possess the requisite form; to ascertain this, it is necessary to understand the parts to be distinguished in a gun-flint. These are five in number; A the sloping facet, B B the sides, C the back, D the under surface, which should be rather convex, and F the upper facet, between the tapering edge and the back.



In order to fashion the flint, those scales are selected which contain at least one of the ridges F or A; he fixes on any tapering border of the scale to form the striking edge; he then divides the scale into pieces, of the proper width of the flint, by means of his chisel; this tool is driven into a solid block of wood, with one of its edges upwards; that part of the flint is placed across this edge where the separation is intended to take place, and a blow from the roulette, or round hammer, on the upper surface, divides it as cleanly as if it were cut; the back of the flint is then made square by the same means.

The last operation is to trim or give the flint a smooth and equal edge; this is done by turning the stone and placing the edge of its tapering edge on the chisel, and striking it a few blows with the round hammer.

THE VERNAL AND AUTUMNAL CROCUS.

SAY, what impels, amidst surrounding snow
Congealed, the crocus' flamy bud to grow;
Say, what retards amidst the Summer's blaze
The autumnal bulb till pale declining days?
The GOD OF SEASONS! whose pervading power
Controls the sun, or sheds the fleecy shower;
HE bids each flower his quick'ning word obey,
Or to each lingering bloom enjoins delay.

WHITE *of Selborne.*

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QUEEN ELIZABETH; HER PROGRESSES AND PUBLIC PROCESSIONS. No. IV.

ASHRIDGE ABBEY, IN THE TIME OF QUEEN ELIZABETH.

CONDITION OF THE PRINCESS ELIZABETH IN THE REIGN OF MARY—HER ARREST AT ASHRIDGE, AND REMOVAL TO LONDON.

THE death of King Edward the Sixth, which occurred on the 6th of July, 1553, was concealed for two days by the Protector, John Dudley, Duke of Northumberland, who was desirous of taking measures to secure the succession of his daughter-in-law, Lady Jane Grey, in conformity with the will which Edward had been induced to make, upon his death-bed, setting aside his sisters Mary and Elizabeth. It was important for the protector's object, that he should have the persons of the two sisters in his hands; and with this view he wrote letters in the king's name requiring their immediate attendance. Mary had nearly fallen into the snare; she was journeying to town when a secret messenger met her with a private communication of Edward's death and the machinations of Northumberland. She immediately turned her horse towards the eastern counties, and never rested till she had reached her castellated mansion of Kenninghall, in Norfolk, which lay at too great a distance from the metropolis to be suddenly surprised. Elizabeth remained tranquil at her residence in Hertfordshire, where she was waited on by Northumberland, who apprized her of Edward's death and the accession of the Lady Jane, and proposed to her that she should resign her own title to the crown in consideration of a sum of money and certain lands which should be assigned to her. With characteristic prudence Elizabeth replied, "that her elder sister, the Lady Mary, was first to be agreed withal; for as long as the said Lady Mary lived, she for her part could challenge no right at all."

The brief reign of Lady Jane Grey ended on the 20th of July; and towards the close of that month, as Queen Mary advanced at the head of her army towards London, the Princess Elizabeth went into Essex to meet her, with a large cavalcade of knights and ladies; Stow says that she was "accompanied by one thousand horse, of knights, ladies, gentlemen, and their servants." Four days afterwards she rode with the Queen to the Tower, through the richly decked streets of the city, amid the discharges of ordnance and the acclamations of the people; seven hundred and forty velvet-coated nobles and gentlemen preceded them, and one hundred and eighty ladies followed them. As an illustration, indeed, of the intimacy which at this period subsisted between the two sisters, it is related by Fox the martyrologist, that "Queen Mary when she was first queen, before she was crowned, would go no whither but would have her [the Princess Elizabeth] by the hand, and send for her to dinner and supper." According to Holinshed, when Queen Mary rode through the city towards Westminster, upon the occasion of her coronation in October 1553, the chariot in which she sat was followed by another "having a covering of cloth of silver all white, and six horses trapped with the like, wherein sat the Lady Elizabeth and the Lady Anne of Cleve." According to the Spanish ambassador then in England, Elizabeth carried the crown

which was used on that occasion; and that functionary reported to his court, that the princess whispered to Noailles, the French ambassador, that it was very heavy, and that she was tired with carrying it; and that the Frechman was heard to answer that she must be patient, and when soon placed on her own head it would seem lighter. "As the Spaniards," says Mr. Sharon Turner, "were at some distance, and could not have heard a private whisper very perfectly, we may assume that the actual speech was, 'if it were on your own head it would not seem so.'"

But the situation of Elizabeth was soon altered. When the design of Queen Mary to restore the Roman Catholic religion became apparent, the eyes of the whole Protestant party were anxiously turned towards the princess, who was well known to be attached to the reformed faith. This circumstance rendered her an object of jealousy and even of fear to the queen. The Venetian ambassador describes Mary as being "a prey to the hatred which she bears my Lady Elizabeth, and which has its source in the recollection of the wrongs she experienced on account of her mother, and in the fact that all eyes and hearts are turned towards my Lady Elizabeth as successor to the throne."

Towards the close of 1553, Queen Mary was very earnest in her endeavours to induce her sister to practise the observances of the Roman Catholic religion. Elizabeth refused to comply; and her enemies then suggested that she should be imprisoned. "I do not doubt," wrote the French ambassador to his court, "that her obstinacy will conduct her to the Tower soon after parliament meets, if things be resolved on as I think they will be." But Mary preferred endeavouring to compel her sister to conform. Elizabeth persisted in her refusal; and her conscientious preference of her own faith was imputed to seditious exhortations. The French ambassador, after relating that the princess would not hear mass nor accompany her sister to the chapel, in spite of all the remonstrances of the queen and her lords, adds, "It is feared that she is counselled and fortified in this opinion by some of the great, and that by these means some new troubles may be preparing." Again shortly afterwards he thus writes:—"The obstacle of Madame Elizabeth is not a little to be feared as up to this time she has been not at all willing to go to the mass. Last Saturday and Sunday the queen caused her to be preached to and entreated by all the great men of her council, who only drew from her at last a very rough answer." Again was her refusal imputed to disloyal machinations; and it was expected that the queen would change her household and even confine her in prison.

In the beginning of the month of December, Elizabeth obtained permission to leave the court and retire to her house at Ashridge, in Buckinghamshire. Suspicion, however, still attached to her, and she was living every hour surrounded with peril.

As the intentions of Mary (says Mr. Sharon Turner,) to bring back popery became visible, the greatest discontents began to arise, with an idea in some naturally arising from Henry's statutes against his daughter, that the young queen of Scots was the rightful heiress of the crown. But the danger to Elizabeth arose from the larger portion of the dissatisfied forming conspiracies to dispossess her sister, and to place her as a Protestant princess on the throne.

Early in the year 1554 the rash and unfortunate insurrection of Sir Thomas Wyatt broke out. Although Elizabeth had no concern in this conspiracy, it involved her in much trouble, and caused her much personal suffering. On the 5th of February, immediately after the insurrection had been suppressed, certain members of the council were sent to Ashridge with a party of horse, with orders to bring the princess to London, "either quicke or dead." The messengers "at their sodaine and unprovided commyng," to use the expressions of John Fox, the martyrologist, found her "sore sicke in her bed, and very feeble and weak of body."

Whither when they came (continues the same historian,) ascending up to her grace's privie chamber, they wylled one of her ladyes whom they met, to declare unto her grace, that there were certaine come from the court which had a message from the queene. Her grace havyng knowledge thereof, was right glad of their commyng; howbeit, being then very sicke, and the night farre spent, (which was at ten of the clocke,) she requested them by the messenger, that they wouldo resort thyther in the mornyng. To this they answered, and by the said messenger sent worde againe, that they must needes see her, and would so doo, in what case soever she were. Whereat the lady being agast, went to shewe her grace their wordes; but they hastily folowing her, came rushyng as soone as she unto her grace's chamber unbydden.

At whose sodaine commyng into her bed-chamber, her grace being not a little amased, said unto them, Is the hast such that it might not have pleased you to come to-morrow in the mornyng?

They made answere, that they were right sory to see her in that case. And I (quoth shee,) am not glad to see you here at this tyme of the night. Whereunto they answered, that they came from the queene to doo their message and duetie, which was to this effect, that the queene's pleasure was, that shee should be at London the seventh day of that present moneth. Whereunto shee saide,—Certes, no creature more glad then I to come to her majestie, beyng right sorye that I am not in case at this tyme to wayte on her, as you yourselves doo see and can wel testifie.

Indeede we see it true (quoth they), that you doo say to which we are very sorye. Albeit, we let you to understande, that our commission is such, and so strayneth us, that we must needes bryng you with us either quicke or dead. Whereat, shee beyng amased, sorowfully said, that their commission was very sore; but yet, notwithstanding shee hoped it to be otherwise and not so strayt.—Yes, verily, sayd they. * * * *

In conclusion, they wylled her to prepare agaynst the mornyng at nyne of the clocke to goe with them, declaring that they had brought with them the queene's lytter for her. After much talke, the messengers declaring there was no prolongyng of tymes and dayes, so departed to their chamber, being enterteyned and cheered as apperteyned to their worships.

On the following morning, at the hour prescribed, Elizabeth was led forth for her journey, very faint and feeble, and "in suche case that shee was redy to swound three or foure tymes" between them. "What should I speake here," exclaims John Fox, "that cannot well be expressed; what a heavy house there was to beholde the unreverend and doulefull dealyng of these men, but especially the carefull feare and captivitie of their innocent lady and maistresse."

Although Elizabeth was able to travel "with lyfe," yet her illness was so severe, that it was not until the fourth night of her journey that she reached Highgate. Here being very sick, she tarried that night and the next day; "during which time of her abode," says Fox, "there came many pursuivants and messengers from the court, but for what purpose I cannot tell." When the princess entered London, great multitudes of people came flocking about her litter which she ordered to be opened for the purpose of showing herself. The remainder of her coming into London on this occasion is thus described in an old manuscript chronicle.

The same tyme and daye, between four and fyve of the clocke at night, my lady Elizabeth's grace came to London through Smithfielde untoo Westminster, with C velvett cotts after her grace. And her grace rod in a charytt, opyn on both sydes, and her grace [had] ryding after her a

100 in cotts of fyne redde gardyd with velvett; and so through Flet-strete unto the court through the queene's garden, her grace being sycke.

Our engraving contains a view of the old abbey at Ashridge, at which Elizabeth was arrested in the manner which we have just described. This place, the name of which was formerly written *Esserugge, Aescrugge, Asserugge*, and *Ascherugge*, is in the parish of Pitstone, in the county of Hertford. It is supposed by some to have been a royal residence before the foundation of the college, as it is well known to have been after the dissolution thereof. The name is derived from "a hill set with ash-trees;" the oldest denomination of the place being *Aescrugge*, from *aesc*, as the ash-tree was first called, and *rugge*, a hill or steep place, afterwards written ridge.

The college was completed in 1285, being founded by Edmund, Earl of Cornwall, whose father Richard*, a person of high repute for his heroic endowments, had been elected king of the Romans, by the unanimous consent of the princes of the empire. It was established for a rector and twenty brethren or canons, called *Bonhommes*, a religious order which had not been previously introduced into England. They were brought out of the south of France at a time when there existed in that country a sect who called themselves *Boni Homines*, (literally *good men*), and were termed in the vulgar Gascon dialect *Los Bos Homes*.

The college at Ashridge was founded expressly in honour of the "precious blood of the holy Jesus;" and the occasion of so remarkable a dedication is thus related by Holinshed:—

Edmund, the son and heir of Richard, Earl of Cornwall, who was second son to King John, being with his father in Germany, and there beholding the reliques and other precious monuments of the ancient emperors, he espied a box of gold, by the inscription whereof he perceived (as the opinion of men then gave) that therein was contained a portion of the blood of our blessed Saviour. He therefore being desirous to have some part thereof, by fair intreaty and money obtained his desire; and brought the box over with him into England; bestowing a third part thereof after his father's decease in the abbey of Hailes, which his father had founded, and wherein his father and mother were both buried, whereby to enrich the said monastery; reserving the other two parts in his own custody; till at length, moved upon such devotion as was then used, he founded an abbey at *Asserugge*, in Hertfordshire, a little from the manor of Bercamsted, in which he placed the monks of the order of *Bonhommes* (good men), being the first that had ever been of that order in England; and assigned to them and their abbey the other two parts of the sacred blood.

In the times of ignorance the imposition was successful, and brought multitudes to Hailes and Ashridge; but when the Reformation came it was discovered and exposed. Bishop Burnet relates the manner in which the exposure took place at Hailes, telling us that the blood there was found to be that of a duck. Of that at Ashridge, Speed says,—

Ashridge was in great repute for the blood (supposed out of Christ's sides) brought out of Germany by Edmund, eldest son of Richard, King of the Romans and Earl of Cornwall: whereto resorted a great concourse of people for devotion and adoration thereof. But when the sunshine of the Gospel had pierced through such clouds of darkness, it was perceived apparently to be only honey clarified and coloured with saffron, as was openly shown at St. Paul's Cross by the Bishop of Rochester, 24th Feb. 1538.

Very soon after the foundation of the college of Ashridge, it rose to be a place of some importance; for in the year 1291, King Edward the First held a parliament in it. It remained in the hands of the Bonhommes till the 26th of Henry the Eighth, when it was visited by the royal commissioners, and the rector and brethren made their recognition of his supremacy. The rental of their estates then amounted to 447*l.* 18*s.* In the following year the first act for the Dissolution of the Monasteries was passed.

After the dissolution Ashridge became a royal residence. We know not to what tenant it was assigned during the remainder of Henry's life; but by a deed dated 24th April, in the year 1551, the house and demesnes of Ashridge were granted to Elizabeth by her brother Edward the Sixth, who is said indeed to have been nursed here. The deed in question is one of the very curious papers in the archives of the Bridgewater family, the present possessors of Ashridge; and in the same collection is another, by which it appears that, on the 28th day of March, 1556, "the right excellent Princesse, the Ladie Elizabeth's grace," leased several parcels of the lands and demesnes, and likewise the mansion and other buildings at Ashridge, for the term of twenty-one years, to one Richard Combe, of Hemelhempsted, gent., at a yearly rent of "six poundes and tenpence of lawful money of Inglande."

When she had been some time upon the throne, Elizabeth granted Ashridge for life to one of her gentlemen pensioners; and three years afterwards she granted it to John Dudley and John Ayscough, and their heirs. After passing through several hands, the property came eventually, in the reign of James the First, into the possession of Sir Thomas Egerton, Lord Ellesmere, celebrated for having been Lord Keeper to Queen Elizabeth, and Lord Chancellor to her successor King James the First. In his direct descendants, the Bridgewater family, it has remained since vested; and by one of them the old abbey was replaced some years ago, by the present structure, which is among the most magnificent modern residences in England.

Of the few letters written by the Princess Elizabeth which have been preserved, the following written to her sister Mary from Ashridge in the reign of Edward the Sixth, is interesting both as a specimen of the epistolary correspondence of the age, and as an illustration of the relation which subsisted between the sisters before the accession of Mary.

The Princess Elizabeth to the Princess Mary.

Good sistar, as to hire of your siknes is unpleasant to me, so is it nothinge feareful, for that I understand it is your olde gest that is wont oft to visit you, whose comminge thogth it be oft yet is it never welcome, but notwithstanding it is comfortable for that "jacula prævisa minus feriunt." And as I do understande your nede of Jane Russel's service, so am I sory that it is by my man's occasion letted, wiche if I had knowen afore I wold have caused his wil give place to nede of her service, for as it is her duty to obey his commandement, so is it his part to attende your pleasure; and as I confesse it were miter [meeter] for him to go to her sins she attendes uppon you, so indide he required the same but for that divers of his felowes had busines abrode that made his tarijnge at home. Good sistar, thogth I have good cause to thanke you for your oft sendinge to me, yet I have more occasion to rendre you my harty thankes for your gentil writinge, which how painful it is to you I may wel gesse by my selfe, and you may wel se by my writinge so oft how pleasant it is to me. And thus I ende to troble you, desiring God to sende you as wel to do as you can thinke and wische or I desire or pray. From Hasherige, scribled this 27th of October.

Your lovinge Sistar,
ELIZABETH.

To my well-beloved Sistar Marye.

* It was this Earl Richard to whom the Pope Innocent the Fourth offered the kingdom of Sicily and Naples, but upon so many inadmissible conditions, that the earl's agent at Rome observed, "You might as well say to my lord and master, 'I sell or give you the moon; climb up, catch it and take it.'"

THE HOUSE I LIVE IN.

No. V.

MAN's body's like a house; his greater bones
Are the main timber; and the lesser ones
Are smaller joints; his ribs are laths daubed o'er,
Plastered with flesh and blood; his mouth's the door,
His throat's the narrow entry, and his heart
Is the great chamber full of curious art.
His midriff is a large partition wall
'Twixt the great chamber and the spacious hall;
His stomach is the kitchen, where the meat
Is often put half sod for want of heat.
His spleen's a vessel Nature doth allot,
To take the scum that rises from the pot;
His lungs are like the bellows that respire,
In every office, quickening every fire;
His nose the chimney is, whereby are vented
Such fumes as with the bellows are augmented;
His bowels are the sink, whose parts to drain
All noisome filth, and keep the kitchen clean;
His eyes are crystal windows clear and bright,
Let in the object, and let out the sight;
And as the timber is, or great, or small,
Or strong or weak, 'tis apt to stand or fall.—QUARLES.

THE House I live in differs in some respects, as we have already seen, from many buildings. An ordinary building of wood, brick, or stone, is intended to stand firmly, no part, excepting the doors and windows, being made for motion. The ends of each part are usually fitted together by square-edged joints, with great exactness, and the frame is kept together by girths, braces, &c.

There are indeed a few parts of the House I occupy, which are not intended to have much motion; but in general the reverse is the case. Even the girths and braces are designed to regulate and direct its movements, but not entirely to prevent them. The joints, instead of being framed together by means of tenons and mortices, and kept as dry as possible, are rounded and made smooth, and moistened by a sort of oil, to suit them for motion, rather than to hinder it.

There are indeed a few joints—if joints they ought to be called—which are firm and unyielding; I mean the teeth. These, as we have already seen, are set into the jaw-bones, as firmly as are tenons into mortices, and even more so. They seem to stand there like nails or spikes, when driven into planks or timbers. The bones of the head, too, are joined firmly together in adults, as you have already been told.

Some of the joints of the human frame are real hinges. To this class belong the knee-joints, the joints of the toes and finger, and those of the elbow. The lower jaw may also be called a hinge-joint. The ankle-joints, the joints of the wrists, and indeed many others, sometimes move like hinges, but they perform other and very different motions besides.

HIP JOINT.

But the most curious joints in the human frame are what are called the ball-and-socket joints. The more important of these are the shoulder and the hip.

At *a* you see the deep hollow or socket in the bone, where the round head of the *femur*, or thigh bone, moves. This round head is drawn back from the bottom of the socket a little way, in order to show the round ligament near *a*. The latter is a very tough, strong cord, fixed by one end at the bottom of the socket, very firmly, and by the other fastened as strongly to the round head of the femur. If it were not for this ligament, the joint would be dislocated, or slipped out of its place, a thousand times more frequently than at present; for now indeed this but seldom happens. Around the socket at the hip is a tough, gristly rim, which greatly increases its depth. This socket is called the *acetabulum;* meaning vinegar-cup. It was supposed to resemble a kind of ancient vinegar-cup in use among the Romans.

HIP JOINT.

Annexed is a figure of another ball-and-socket joint, and also of a hinge-joint—the shoulder being an illustration of the ball working in a socket, and the elbow acting upon the principle of a hinge. Every one understands the nature of a hinge, which is in such constant use, and therefore the motion of the elbow-joint will be very readily understood.

Let us examine the joint of the elbow. The lower portion of the arm is formed of two bones, one large, called the *ulna*, and the other smaller, called the *radius*. The upper end of the small bone *d*, is a little rounded, and it lies against a small hollow, or depression, in the other bone, the ulna, at *g*, to which it is tied by cords, called ligaments, particularly by one which goes round it like a band. The ends of these two bones, thus united, turn on the end of the upper one, which is rounded and tipped with cartilage, and thus fitted for the purpose, as we see at *f*. They are kept together in a living person, (as indeed all bones are,) by broad and short straps or cords, called ligaments, which adhere to each end of the bone a little way from the joint, and are very tight and strong, and yet not so tight as to hinder the proper degree of motion.

To enjoy the entire use of the arm, two distinct motions are requisite, which may be employed separately or together, at will. For this purpose, while one of the bones of the fore-arm only, the *ulna*, is attached to the *humerus*, or bone of the upper-arm, the smaller bone of the fore-arm, or *radius*, is enabled to move in a hollow, or depression of the ulna, by means of its rounded upper end. At the lower end of the arm, this arrangement is reversed; the radius, instead of furnishing the head, becomes in turn the receiver, and the prominence of the ulna plays within a depression on its surface. By means of this reversed arrangement, the greatest freedom of motion is admitted, and, by the greater pliability which is gained, fractures and dislocations rendered less likely to occur.

But a ball-and-socket joint is more curious still. The bone which is represented at *b*, is the *scapula*, or shoulder-blade. The hollow place at *e*, is the socket in which the round head or ball, *a*, of the upper bone of the arm, (the humerus,) plays freely, when the arm is moved. The socket is so shallow, and the ligaments so long, in order to enable us to make almost every kind of motion with our arms, that it is much more easily slipped out of joint, or dislocated, than are the hinge-joints. Even the hip, which is also a ball-and-socket joint, has a much deeper socket; and it is partly on this account, and by a different arrangement of muscles, that we cannot

swing our legs round with as much freedom as we can our arms.

The number of hinge and other joints in the frame of the House I live in is very great. It must be nearly, if not quite, a hundred and fifty.

You see the wisdom of the great Creator fully displayed in this structure and connexion of the bones. What if the joint of the knee could move in every direction, like that of the shoulder? Do you not see that when we walked, the legs would have dangled about strangely, instead of moving backwards and forwards in one direction only? And is it not plain that we never could have stood firmly on the ground? In like manner, how very inconvenient it would have been, to have our finger-joints move one way as well as another! On the contrary, how confined and cramped would have been the motion of the arm, if the shoulder had been like the knee, and had only permitted the arm to swing backwards and forwards, without our being able to carry it outward from the body!

LIGAMENTS.

But how are the joints held in their places? When we take up a bone which has lain, perhaps for years, bleaching in the sun and rain, we see that the ends are smooth, and some of them hinge-like; but if we take up two such bones, and put them together, they will not stay in that condition a moment, unless they are fastened by strings or wires, or something of the kind. How, then, are they kept together in the living person? This is what I am now about to tell you.

They are held together by short and strong straps, called *ligaments*. Some of them, however, are longer, and begin at a considerable distance, say an inch or two, from the very end of one bone, and then, after passing over the joint, are fastened into the next. This strap, or ligament, does not adhere or stick to the joint, as it passes loosely over it, but is only fastened strongly, where it rises, and where it is inserted, as if it were there glued to the bone. The inside, where, in crossing, it lies against or rests gently on the joint, is very smooth; so that the joint, in moving, may not grate or wear out.

These ligaments are white and shining, but not always very thick. They are usually very strong. Some of them are as narrow as a piece of tape. Others, as at the sides of the knee, or at the shoulder, are very wide. Some cross each other, as in the knee-joint. The latter are shown in the engraving, *a*. There are others that go all round the joint, and completely shut it up: as if the ends of the two bones were put into the two open ends of a short cylinder, or rather of a short bag or purse, and the open ends were then gathered round, and fastened tightly to the two bones; in this way, the joint would be completely shut up, as in a sack. This sort of ligament is called a *capsular* ligament. It would be difficult, nay, even impossible, to enumerate all the ligaments in the body, they are in many instances so interwoven with each other, and frequently inseparably united. It will be sufficient here to mention that the junction of the head with the spine, the whole length of the spine itself, the hand and the foot, are literally crowded with ligaments of different shapes and attachments, as may be best adapted for imparting strength and flexibility; and that each of the larger joints has several ligaments in connexion with it, the knee-joint alone being considered by some anatomists as having fourteen distinct ligaments to its own use.

The bags, or sacs, called *capsular ligaments*, are principally intended to prevent the joint from being easily slipped out, or dislocated. They also serve for another purpose, scarcely less important—a purpose which shows the wisdom of the great Creator in the contrivance of the human frame, more than almost any other; if, indeed, any comparison can be made where all is excellent.

The Father of the universe is the preserver as well as the creator of this "wondrous frame." Was there not something done to keep these joints oiled, if I may so call it, they would not last long. Take the knee, for example; and think what a vast deal of friction or rubbing together of the end of the thigh-bone and of the two leg-bones there must be.

A traveller probably swings each leg, in walking, about 1200 times in a mile. If he should walk thirty miles a day all the year excepting Sundays, he would swing each knee 15,024,000 times. Were he to do this every year, from the time he was twenty years old till he was seventy, or for a period of half a century, the number of movements would be 751,200,000 times! Now this continued rubbing of the bones of the knee together, if they were allowed to get dry, would wear them so much in a single day, that we should hear a grating noise at every step, long before night, and, in a very few days, the bones would be completely worn out and unfit for use. I question if they would last even a whole day. Iron or steel would wear out in a very short time. What, then, can be the reason why the knees and all the other joints do not wear out?

I have said that many of the joints are completely shut up, as if they were in a sack. Now the great Contriver of the animal frame has so contrived it, that a substance, called *synovia*, which answers all the purpose of oil or tar, continually oozes out on the inside of the ligaments at the joints, and keeps the ligaments themselves, and the joints, soft and moist. The synovia, or liquor which thus oozes out to lubricate the joints, is of just the right quality and quantity when we are in perfect health. If we are unwell, there may be too little or too much, or it may be too thick or too thin. If we use food or drink that is too heating or irritating, the synovia will become less in quantity or of poorer quality.

In these, and in other evils, prevention is better than cure. Those who live on moderate food, and avoid strong drinks, and work steadily but moderately, rarely have any trouble of this sort.

It has been said, that the ligaments hold the joints together. They do so; but the tendons or straps, which go off from the ends of the muscles, and are fastened into the several bones around their joints, materially help to hold them together. There are other wonderful contrivances to keep the joints firm and yet moveable, into which we cannot at present go.

That the great Creator made the joints to be used, is proved from their curious structure, and from the substance prepared to moisten them; but that they were not made to be used too violently is also proved by the fact, that if thus used, they become diseased. Sometimes the liquor called the *synovia* dries away; in these cases the limb becomes stiff and incapable of motion; at others, the joints become painful and often enlarged. It is but seldom, however, that they become diseased from mere exercise, provided our habits are temperate and regular; though occasionally rheumatic, and other painful affections, will encroach upon the ease of our sensations and the symmetry of our forms.

THE DUTCH FISHERIES.

No. I.

THE HERRING FISHERY.

THE Dutch have three sorts of fisheries,—the Herring, the Cod, and the Whale. Formerly the Herring Fishery was the chief branch of their industry, their grand source of wealth; it was called, at the time we refer to, the golden mine of the republic. Though still their principal fishery, it has much declined since the beginning of the last century. On the establishment of the French domination in Holland it fell to nothing; revived at the restoration, but has not yet reached its ancient prosperity. The monument raised in the fifteenth century, at Berliet, in honour of William Beukelson, who first discovered the art of curing herrings, shows how much importance was attached at that early period to this branch of trade. The first cause of its decline lay in the wars of Holland, during the latter part of the eighteenth entury, when English vessels cruised continually in the North Sea, and captured the Dutch fishing vessels. Again, during what the Dutch called the French epoch, the period during which Holland shared all the fortunes of France, she had to submit to the consequences of such an alliance. France, though triumphant on the Continent, was, so to speak, besieged in all her ports, and Holland, a country essentially maritime, was in the same plight. Such fishing vessels as ventured out to sea were almost invariably made prizes of, especially near the mouth of the Maas, where English men-of-war were sure to be on the look out for them. Besides, the Dutch in general considered themselves as in a conquered country, an idea which encouraged all sorts of disorders. Smuggling was considered lawful, the fishery regulations were neglected, and what herring was caught, was cured so ill as to become spoilt when exported.

Vlaardingen, on the right bank of the Maas, and two leagues from where that river joins the sea, is the only town whose inhabitants now carry on the fishery with spirit; they employ in it about 100 vessels. A century and a half ago, Browershaven, in Zealand, sent out 200, but that port is now deserted. Maassluis, at the mouth of the Maas, once counted 200, and has now only 20; Amsterdam has 15; Enkhuizen, on the Zuyder-Zee, instead of 200 which it once had, has now but three or four. Excepting Amsterdam, these towns had no other trade, and now their deserted harbours seem as if waiting for some new commerce to infuse a second life into them. Vlaardingen alone has escaped the general ruin, and continues to thrive; its fishing fleets are sent out by persons owning one or more vessels individually, or by joint-stock companies, owning up to 20.

The greater number of vessels destined to the herring fishing, return from that for cod, towards the end of May, or early in June. Tarring, painting, engaging men, providing stores, and preparing sails and rigging, create a deal of bustle for a fortnight among the population of Vlaardingen, who amount to about 17,000.

On the 10th or the 11th of June the captains and officers present themselves at the town-house, and swear that they will observe themselves, and see to the observance by others, of the fishery regulations; this done each hoists his colours. On the 14th of June, called colours' day, the people go to church, and pray to God for a blessing on the expedition. On leaving church they parade about the harbour, where the vessels are curiously placed, each having its prow turned right in shore, and its bow-sprit passing over the quay. They are all in beautiful order, and having their flags displayed, make a handsome appearance. Among the flags, one larger than the rest is hoisted astern, bearing the vessel's name, in gilt or black letters, on the white streak, the national flag having three horizontal streaks or bands. Crowds of curious persons come in from the neighbourhood, and as an eight days' fair commences at the same time, Vlaardingen wears a most animated appearance.

It is usual at this time to go on board the vessels, and drink good health and a prosperous voyage to the captain, who regales his guests either in his little cabin or under an awning on deck. Generally, too, the owners and their friends visit the captain on board his ship, as well as his own friends and family.

In former times much importance was attached to the sailing of the fleet on the 15th of June; but now, should the wind prove adverse, the vessels leave the harbour and lie at anchor in the Maas for two or three days, after which they must put to sea, or forfeit the government bounty.

The fleet is attended by an extra ship, or tender, carrying additional hands to take the place of such as fall ill or meet with accidents; properly speaking, it is a moving hospital (*ambulance*). It cruises for a fortnight with the fleet, receiving the sick and disabled seamen, and replacing them with others; it then makes for Shetland Bay, in the islands of that name forming the northern extremity of Scotland, and the centre of the fishing operations; there it spends a fortnight in attending to the recovery of its invalids; that period expired, it rejoins the fleet and cruises for another fortnight, returning the cured seamen to their respective vessels, and taking back the men it had left to supply their place. Thus it alternates during the whole of the fishing season. The men often injure their hands with the nets, which excoriate their fingers and impregnate them with salt, although fenced with gloves of leather, doubled with thick worsted Iceland gloves.

The tender which thus convoys the fleet has a carpenter and a cooper on board; these repair damages, and are of the utmost use. It has also an officer attached to it, who is specially charged with maintaining a strict observance of the fishing regulations, and with the prevention of smuggling in the Shetland Islands; he acts, indeed, as a sort of commissioner from the government.

The fishing is carried on from the 24th of June to the 30th of October. Twelve of the fastest sailing vessels are selected to carry home the first-caught herrings with the utmost speed. These vessels, called *jagers*, (chasers,) are under orders of one of their own number as admiral's ship. Each chaser has, in addition to its ordinary crew, an officer, called *koopman*, who keeps an exact account of the herrings taken on board, and of the vessels that supplied them.

The fleet generally proceeds as far as Hookness, but it is not easy to say where the herrings are found in greatest plenty. The fishermen go northward or southward, according to their knowledge of the habits of the fish, or their experience, and often according to orders from the owners. Herring caught towards the north is preferable to that caught towards the south, the flavour being infinitely superior.

It is forbidden to fish within five miles of the Scotch coast, by common accord of the British and Dutch governments; the former as a check upon smuggling, the latter because the herring caught near the land has the spawning sickness (*kuitziekte*). Britain insists, also, that rigorous measures be taken to prevent fraud. The luckless seamen who may be caught passing gin or tobacco into the hands of

smugglers in Shetland Bay, are condemned by the Scotch judges to fines and imprisonment; the sentence is intimated to the captain of the person convicted, and executed on his return to Holland.

On the 24th of June the nets are shot into the sea, and to fish sooner is forbidden, in order that all may start fair. That day accordingly is not forgotten at Vlaardingen; the owners meet together and dine; happy in the prospect of the success each anticipates for himself, many a toast is drank to the prosperity of the expedition.

The fishing once commenced, the chasers above mentioned cruise about in all directions, and collect the first-caught herrings; these are again transferred to the vessel selected to sail first until its freight is full; then a second is freighted, and so on. As each receives its complement of herrings, or when the proper moment for sailing homewards has arrived, the admiral authorizes their departure by signing the koopman's invoice; this goes on until its own turn arrives, and then his ship sails the last.

The freight of the chaser first despatched is generally from 16 to 20 tons, that of the second 60, and so on, augmenting as the value of the herring falls, that of the admiral being above 300 tons. The chasers often come to port without a full freight, either from the fishing being bad, or from the time lost in the freighting of those sent first, leaving not enough of time to freight the remainder. When the season is far advanced, the admiral must send them off, else they might arrive all at once, and produce a glut of herring following on a scarcity. The chasers are called first, second, and so on, in the order of their leaving the fishing ground, not in that of their arrival at Vlaardingen; for it may happen that the fifth, for example, by meeting with contrary winds, or by being damaged in a gale, may come into port after the sixth. Once discharged, they may put to sea again as fishing vessels, whereas before they were not allowed to fish. All ought to have returned to port by the 4th of August, up to which date the fishing vessels are not allowed to come in and sell their herrings in competition with what the chasers have brought. Should any be forced to return in consequence of damages sustained at sea, the herring it has caught since the freighting of the last chaser, is not allowed to be sold until the 4th of August; if any arrives in port after the day fixed for their return, it is sent away to a foreign port. The captains are bound on oath to hand over all the herrings they take to the chasers, until the whole up to the last are freighted. The regulation which obliges chasers arriving past their time to go to a foreign port is a very wise one, for thus all the proprietors of vessels forming part of the chasers' union, participate in the loss; this late arrival, however, seldom happens.

Moreover, all are not despatched to the port from which they sailed. The first always makes for Vlaardingen, the second for Hamburgh, the third for Maasslüis, and so on; but Vlaardingen is the resort of several, and always of the admiral. It is a good speculation to send a chaser to Hamburgh, for if it arrive before the Embden fishermen, it is sure to sell its herrings well.

The produce of all the herrings sold by the chasers is thrown into a common fund, and distributed among the members of the union, according to the quantity of fish supplied by the fishing vessels belonging to each, and charged against the common fund.

The arrival of the first chaser at Vlaardingen is a real fête; it generally takes place about the end of June, or beginning of July. From the moment that the vessel is expected, two men are posted at the top of the town steeple, with their eyes turned the whole day towards the sea. On descrying the expected chaser in the offing, notice is sent to the owners, and to the families of the men who form its crew; a flag also is hoisted from the steeple as a signal.

No sooner is this flag perceived throughout the town and neighbourhood than a cry of joy resounds on every side; the inhabitants meet in the streets, everything gives note that the port is about to resume its activity, after being like a desert since the fleet sailed. The quay, and the street leading to it, are crowded; each wants to know what proportion his friends or relatives have contributed to the freight of herring, and this is soon known, as the koopman lands in a pinnace with the invoice in his hand, and gives it to one of the owners who reads it aloud. The vessel is straightway moored, and discharges its precious cargo, which is generally sold at 800 florins the ton. But before allowing the sale to commence, two carriages are despatched with the first-fruits to the king and his ministers. Each is attended by two personages, one of whom drives while the other waves a flag. Their mission is not without fatigue and danger, for they must gallop all the way, but the king in return gives them a gratuity.

For the last five years there has been an association of shipowners, connected with the herring trade. It enjoys the protection of the government, and all must join it or forfeit their claim to the bounty, amounting to 700 florins. This association buys all the herring brought in by the fishing vessels, at prices fixed by a commission, but in reselling them it is free. The price fixed for the first ten vessels is higher than for the next ten, and the fall continues down to a minimum of 17 florins for the barrel of full herrings; above that for the *maatjen*, or best quality, and less for inferior qualities, such as the spawn-sick herring, (*kuitziek*,) the weak, (*sleppen*,) the *ijlen*, the *vrakken*, &c. The *maatjen* are the fry of the preceding year, hence small sized but good, and in great request. The *sleppen* come from barrels which have somehow or other lost their salt, which makes the fish soft and insipid.

Since the close of the French epoch, laws have been made on the manner of salting the herrings, and these are strictly observed. The sailors must put so much salt into each barrel; this preserves the fish, and has produced a revival of the trade. The Baltic, the north of Germany, and the interior of Holland, consume the greater part, and part goes also to the East Indies.

The fresh-herring fishery is carried on at Scheveningen, a village on the North Sea coast, about three miles from the Hague, and also by the inhabitants of the shores of the Zuyder-Zee. The vessels sent out from Scheveningen to this fishery are called bommens; they are flat, and far from elegant; this form is given them as a security against accidents among the numerous shoals and sand-banks of that coast. These bommens are of small size, and never go very far out to sea. The boats employed in the Zuyder-Zee are shaped differently, and have various other names, such as *pinkens*, *sockkers*, *hengstens*, &c. The same sort of craft may be seen at Scheveningen, but only for the petty fishing on the coast.

The herring caught off Scheveningen and in the Zuyder-Zee is, in a great measure, affected with the spawning sickness. It is smoked for a single night and sold as sour herring (bokking); or, after being smoked for several days, it is sold as English sour herring, which is the better way. It is eaten also without being smoked.

As the vessels destined for the great fishery are

forbidden to land unsalted herring, in like manner are the Scheveningen and Zuyder-Zee fishers forbidden to salt theirs. The reason is very simple. Great as is the abundance of herrings caught near the coast, the quality is inferior, and but for such prohibitions, the cost and trouble of procuring the rarer herring found on the north of Scotland, might deter persons from going for it. That taken so easily on the Dutch coast might engross the market, and so people would have bad fish at home, and the foreign trade would be injured; for even when salted the herring caught near the coast corrupts and becomes unwholesome food.

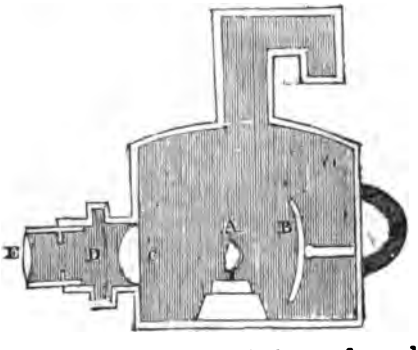
Notwithstanding this, the abundance found in the Zuyder-Zee has given rise to a sort of commerce which must injure the salt-herring trade, and affect the health of consumers. For some years past Frenchmen have gone into the Zuyder-Zee, and bought herrings from the coasting fishers; these they gut and salt on board their own vessels, and then take them to France, where they are sold as herrings caught out at sea. These speculators come from Dieppe, Dunkirk, and other less considerable ports.

THE MAGIC LANTERN AND PHANTASMAGORIA.

THE Magic Lantern, so well known for its amusing effects, was invented by the celebrated German philosopher Kircher, who lived at the beginning of the seventeenth century. The principle on which it is constructed is much the same as that of the Camera Obscura *, but the arrangement is materially different.

Fig. 1 represents a section of the lantern, showing the internal arrangement of the lenses; A is a lamp

Fig. 1.



enclosed in the lantern, which is so formed as to allow no light to escape except through the double convex lens, E. The rays of light from the lamp which fall on the concave mirror, B, are reflected towards the nearly hemispherical lens, C, by which they are condensed, and pass on to the glass slide, on which the objects are painted in transparent colours, at D.

The image of the object at D is magnified in passing through the lens at E, and is ultimately received on a white screen placed at some distance in front. The lens E is fixed in a sliding tube to allow it to be adjusted to the distance of the screen from the lantern, so as to produce a clear image of the object.

The instrument is made more perfect if two lenses

Fig. 2.

are employed, as shown in fig. 2, instead of a single lens, E. In these arrangements the following are considered the best relative forms of the lenses and mirror.

* See *Saturday Magazine* Vol. XI., p. 72.

The concave mirror may be of any concavity required, but the flame of the lamp must be placed as nearly as possible in the *principal focal distance* of the mirror, which may be found in the following manner. Suppose A B, fig. 3, to be a section of a concave mirror, the curve of which could be described by placing one foot of a pair of compasses in the point C; if a line is drawn from C to the centre of the mirror at E, the point D, midway between C and E, will be the principal focal distance, and the rays of light received from the lamp by the mirror, will be reflected in parallel lines so as to fall with equal intensity upon the lens C (see fig. 1.) This lens must be of such a power that its focus shall be at or near the surface of the glass on which the picture is painted; the focus of a double convex lens in which the curves on both sides are alike, is equal to the diameter of a circle, of which its curve forms a portion. Thus, suppose B, fig. 4, to represent a lens, whose curved surface would form part of the circle, C D; by the rule given, the distance of its focus from the centre of the lens would be equal to A B.

Fig. 3.

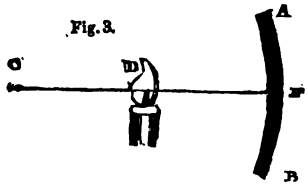
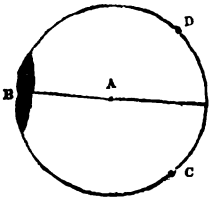


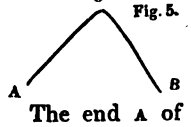
Fig. 4.



The Phantasmagoria produces its effects by the same optical arrangement as the Magic Lantern, but the pictures differ in having their back ground painted black, and instead of their being exhibited on a white opaque screen, they are seen through a transparent screen of calico oiled or wetted. The lantern is mounted on wheels, so as to be steadily rolled to a greater or a shorter distance from the transparent screen behind which it is placed, by this means increasing or diminishing the size of the projected image. In some cases, instead of being rolled along a platform or table, it is strapped round the body of the operator, who advances or recedes from the screen.

Another contrivance is attached to the lantern of the Phantasmagoria, which is not found in the Magic Lantern. The front lens of the instrument, instead of being fixed in a sliding tube, is placed at the end of a leather case containing a spring, whose action keeps it pressed outwards, acting like an old fashioned powder-puff. Two levers, A C and B C, fig. 5, are employed in the following manner, to regulate the action of this spring, and consequently bring the glass at its extremity nearer to, or allow it to recede further from, the slide on which the figures are painted. The end A of the lever A C, is fixed to the framework of the lantern nearest the exhibiter, where it works on a centre; at C it is attached to the lever C B, and the end B of this lever is fixed to the extremity of the leather tube, in the same manner as A is to the lantern, consequently, by bringing A and B nearer to each other, the glass is drawn back, and the spring of the tube itself will act in the contrary direction when left at liberty to do so. The object of this contrivance is to keep the lens at a proper focal distance from the screen.

Fig. 5.



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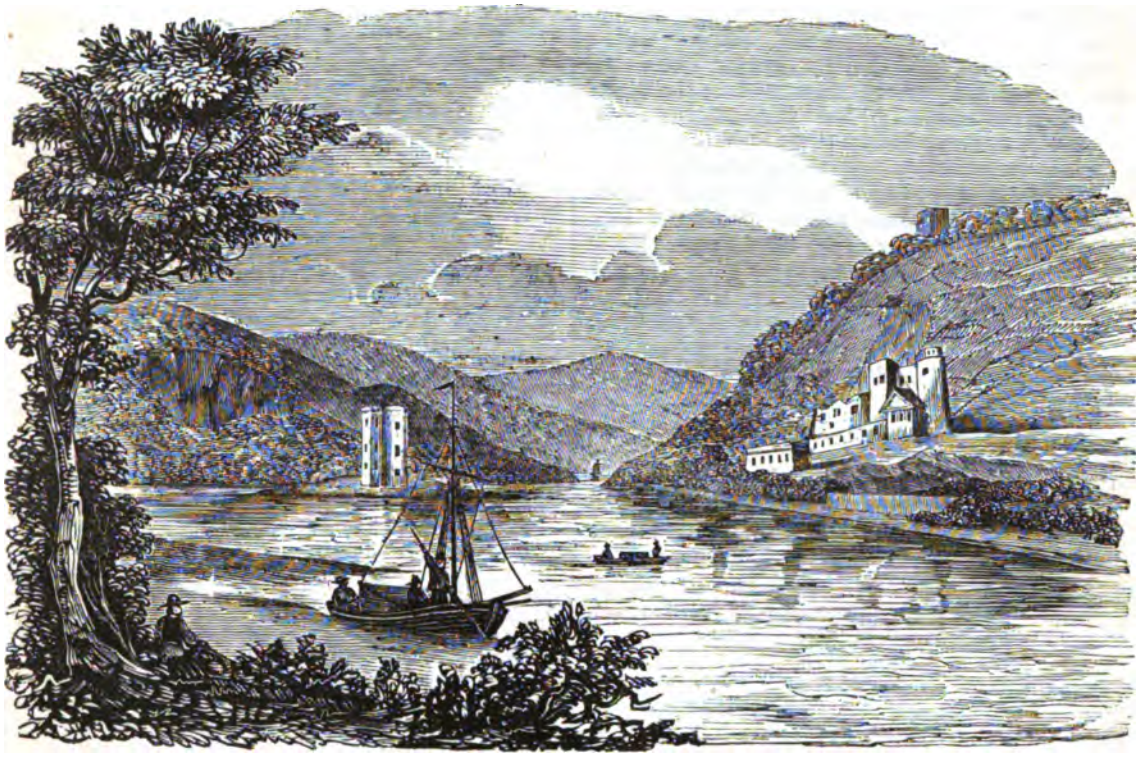
THE RHINE. No. V.



THE MICE-TOWER, AND CASTLE OF EHRENFELS

THE RHEINGAU—THE MICE-TOWER—THE CASTLE OF EHRENFELS.

Here Nature stood still, strewing with lavish hand,
Her living beauty over hills and valleys,
With lingering step
Adorning the landscape

In a former paper* we gave a description of the little duchy of Nassau, which is bounded along its southern and western frontiers by the river Rhine. We now proceed to speak of that remarkably fertile and beautiful portion of it which lies between the border of the river and the Taunus Mountains, and which is known as the *Rheingau*, or district of the Rhine. It is a narrow strip of country, rather more than nine English miles in length, and of a varying breadth, never exceeding four miles. Its eastern limit, or the beginning of it to a traveller descending the Rhine, is at Wallauf, a little below Mentz, and its western limit or termination at Lorchausen; at least the tract comprised between these limits is that to which the name of Rheingau is generally applied by tourists, though, properly speaking, its eastern extremity is at Schierstein, a little above Wallauf, and its western extremity a little above Lorchausen.

The Rheingau is celebrated over Europe for the loveliness of its scenery and the rich produce of its soil. Among the different wines with which we are acquainted at the present day, those of the Rhine hold a high place; and of the wines of the Rhine there are none which can be put in comparison with those which are produced in the Rheingau.

This paradise, (says a German writer, the Baron Von Gerning,) like the region of Naples, may be styled a portion of heaven fallen down to the earth. The majestic Rhine lingers in his course through it, and in honour of it forms nine verdant islands. The solemn Taunus throws his woody arms around it to protect it from the rough and boisterous north. Vine-covered hills, fields, and meadows, and human dwellings, are intermingled most agreeably; and in this Elysium we fly from place to place, in an overpowering ecstasy which defies description. Hallgarten, a village in the forest, with its Hyndelberg adorned with vines, lies in a charming situation close to the wood-covered heights. The well-preserved castle of Volrats has a most picturesque appearance amid its soft hills behind the beautifully enthroned Johannesberg. Further back the ruins of the burg of Scharfeustein, on a rocky vine-covered mountain, towers above the wooded valley of Kiderich. The mild vineyards stretch sweetly round the golden Markt-brunner Stralenberg, down to a narrow causeway (which is throughout protected by an old railing, but cut by a parapet wall), between Erbach and Hattenheim, where the important frontier fountain pours itself with a pleasing murmur into a sandstone basin (in the chapel, fitted up with elegant seats, erected in honour of it in the celebrated vintage-year 1811,) in order that travellers may refresh themselves with the water as well as the wine of Mark-Brunn. A beautiful range of vine-hills again follows; we approach the Johannesberg, the Rothenberg, (so called from the red colour of its soil), and the Niederwald, and everything assumes a more gay and southern appearance. A road of five leagues in length from Schierstein, the commencement of the modern Rheingau, to Rüdesheim, comes

* See *Saturday Magazine*, Vol. XI., p. 233.

in contact with eight other places, namely, Walluf, Elfeld, Erbach, Hattenheim, Oesterich, Mittelheim, Winkel, and Geisenheim, most of which are surrounded by beautiful country seats, presenting a series of the most agreeable pictures to the delighted eye, and putting the friend of antiquity in mind of the villas of the Romans. Geisenheim, the streets of which are still unpaved, and which may be considered as a large village, has something distinguished and solemn about it in this respect. The Rhine between this place and Galshein, is more than half a league in breadth, which is the greatest breadth it ever attains between Basle and Holland, and the green-coloured majestic stream has now all the appearance of a lake.

The Rheingau was originally a free Salic possession, and was divided into the Upper and Lower Bounds; the former comprehending the district along the mountains, and the latter the district along the banks of the river. It was next divided into Rhine townships and Forest townships; the frontier of the latter being protected by five strong bulwarks, which lowered immediately above the principal passes. Beyond this line were some Forest villages and cantons, over which the rulers of the Rheingau possessed a criminal jurisdiction, and which took part in the district assemblies. The whole territory was protected on the forest side by a frontier intrenchment, consisting of hedges and underwood tangled and plashed together, a species of barricade called *gebück*, which enabled its defenders in the Thirty Years' War, to obstruct for some time the progress of their antagonists.

In the stirring and vigorous times of the middle ages, the inhabitants of the Rheingau were exposed to frequent feuds. In the thirteenth century they still had their particular *gaugraves*, or "counts of the gau." This noble tract of country passed by degrees into the hands of the Archbishops of Mentz; and when it was finally united to their domains, the place of the *gaugraves* was supplied by vicegerents. The inhabitants had their separate constitution, defensive institutions, liberties and privileges, without the confirmation of which they would not pay homage to a new ruler. Additional rights and liberties were conferred on them by the Archbishop Adolphus the Second, whom they assisted in 1462 against Diether and the citizens of Mentz. They were also exempted from feudal service and compulsory military duty:

They have a common saying among them that "the air of the Rheingau makes a man free." The old national maxim of Germany, "What we were not consulted in, that we will not assist in executing," was peculiarly in force among them. According to the descriptions of former times, the Rheingau was "a free, obedient, incomparable portion of the territory of the church of Mentz." In return for the immunities respecting markets and customs, which they enjoyed, the inhabitants of the Rheingau preserved from the year 1200 the right of defence of the town of Mentz, a right which they still exercised in 1792. . . . . The inhabitants of the Rheingau are kind, frank, hospitable, and, generally speaking, endowed with a certain innate hilarity which well becomes them. As the district was itself separated from the adjacent country by the Rhine and a trench, its inhabitants were in like manner a separate people. They yet form, as it were, only one family, especially the inhabitants of Rüdesheim, who are almost all related to each other, and who seldom marry elsewhere. Persons when they meet greet each other with the words, "Good time!" which, in a bad time, sounded doubly grateful.

The most delightful period of the year in the Rheingau is the season in which the vine puts forth its blossoms, when the whole country is filled with the most delightful fragrance, and that in which its ripened fruits are gathered and their juice expressed for the wine-making. The men and women connected with the cultivation of the vine at times form processions with music and singing; in the ceremonies which accompany the end of the vintage a female is elected "wine-matron." With respect to climate, the Rheingau is spoken of as being indisputably the most southern zone in Germany. The road from Geisenheim to Rüdesheim is the most beautiful of the whole Rheingau; and a row of walnut and elm-trees affords also that grateful shade which is the more to be valued, because it is so seldom met with, in this wine-region, where greater attention is generally paid to the culture of the grape than to that of ornamental or fruit-trees.

The appearance of the Rheingau from the overhanging hills which divide it from the inland upper country of Nassau is very fine. The author of *Bubbles from the Brunnens of Nassau*, speaking of a view from one of the summits, a hill near the monastery of Eberbach, characterizes it as being, without any exception, the finest he had witnessed in the country.

Uninterrupted by anything but its own long narrow islands, I beheld the course of the river from Johannisberg to Mainz, which two points formed from the grotto where I stood an angle of about one hundred and twenty degrees. Between me and the water lay, basking in sunshine, the Rhinegau covered with vineyards, or surrounded by large patches of corn which were evidently just ready for the sickle; but the harvest not having actually commenced, the only moving objects in the picture were young women with white handkerchiefs on their heads busily pruning the vines; and the Cöln [Cologne], or as it might more properly be termed, the *English* steam-boat, which immediately before me was gliding against the stream towards Mainz. On the opposite side of the Rhine an immense country highly cultivated, but without a fence, was to be seen.

The Baron Von Gerning compares this enchanting tract of country when viewed from an adjacent height, to "a carpet of delight, skilfully woven by the formative hand of nature."

> A vale of pleasance spreads beneath our feet;
> The plains adorned with golden grain, the heights
> With golden grapes. Village to village joins;
> For where the earth the lightest toil rewards,
> With lavish hand does man delight to build.

The natural advantages of the Rheingau will appear the more strikingly to the traveller, if he first traverse a portion of the upper country of Nassau, and then descend to the Taunus mountains. Every step that he takes in the descent will introduce him to a more genial climate and vegetation. In the summer-season the contrast will be particularly striking. Instead of breathing the keen light mountain air which appertains to the upper country, he feels himself overpowered by the burning sun, which is hurrying to maturity the abundant crops around him. The luxuriance which Nature has imparted to the vegetation of the Rheingau is not more remarkable than its variety. A writer already quoted, took the trouble to note down the different crops which he passed in riding from Frauenstein, which lies low in the Taunus range, to Mentz; and he gives the following list as well calculated to convey "some idea of the produce of the highly-favoured belt or district of Nassau, (known by the name of the Rheingau,) which lies between the bottom of the Taunus hills and the Rhine:—

Vineyards,	Potatoes,	Horse chestnuts,
Hop-gardens,	Carrots,	Almonds,
Fields of kidney beans,	Turnips,	Quinces,
Tobacco,	Clover of various sorts,	Medlars,
Hemp,	Grass,	Figs,
Flax,	Lucerne,	Wild Raspberries,
Buck-wheat,	Tares,	—— Gooseberries,
Kohl-rabi,	Plum-trees of various	—— Strawberries,
Mangel-wurzel,	sorts,	Currants,
Fields of beans & peas,	Standard apricots,	Gooseberries,
Indian corn,	Peaches,	Whortleberries,
Wheat of various sorts,	Nectarines,	Rhubarb,
Barley,	Walnuts,	Cabbages of all sorts,
Oats,	Pears,] of various	Garlick,
Rye,	Apples,] sorts,	"omatoes
Rape	Spanish chestnuts,	

A part of the Rheingau mountains lying behind Rüdesheim, is occupied by the forest of the Neiderwald. It is richly wooded; and the charming situation of its summit induced the former possessor to build an edifice on it, which cost him above half a million of florins, (about 55,500*l.*), and which is very much visited. The principal part of it is a hunting castle, which stands at the extremity of the forest near the Rhine; its position, however, is not quite in front, so that the view which it commands of the Rhine, although very romantic, is confined.

The view from a small temple over the best part of the Rheingau, (says Von Gerning,) the picturesque islands of the Rhine, and the majestic stream which spreads itself out like a lake, and in which everything is reflected as in a mirror, is altogether unique and exquisitely beautiful. At one time we imagine ourselves by the lakes of Zurich and Bienne; at another by the lake of Lugano, and then again we feel ourselves transported to the charming regions of Italy, which, however, possesses no river like the Rhine.

A still more beautiful view is obtained from the summit of an old tower called the Rossel, which stands at the extremity of the cliff overhanging the river, and lying above the ruined castle of Ehrenfels, whence the spectator sees the Rochusburg beneath him on the opposite side of the river, the winding river Nahe almost at his feet, with the town of Brugen and its ancient ruins, and the Mausethurn or Mice-tower on its little island in the middle of the Rhine. This prospect is thus described by the author of *Bubbles from the Brunnens of Nassau*:—

We ascended through a noble oak wood, until reaching a most celebrated pinnacle of the Taunus mountains, we arrived at the Rossel, an old ruined castle, which standing on the Niderwald, like a weather-beaten sentinel at his post, seemed to be faithfully guarding the entrance of that strange mysterious chasm, through which, at an immense depth beneath, the river was triumphantly and majestically flowing. Although the view from the ruined top of this castle was very extensive and magnificent, yet the dark, struggling river was so remarkable an object that it at first completely engrossed my attention. While the great mass of water continued to flow on its course, a sort of civil war was raging between various particles of the element. In some places an eddy seemed to be rebelliously trying to stem the stream, in others the water was slowly revolving in a circle;—here it was seen tumbling and breaking over a sunken rock—there as smooth as glass. In the middle of these fractious scenes, there lay, as it were, calmly at anchor, two or three islands, covered with poplars and willows, upon one of which stood the ruins of the Mausethurn, or tower of that stingy Bishop of Mainz, famous, or rather infamous, in the history of the Rhine, for having been gnawed to death by rats. On the opposite side of the river were to be seen the Rochus Capille, a tower built to commemorate the cessation of the plague, the beautiful castle of Rheinstein, the residence of Prince Frederick, of Prussia, the blue slated town of Brugen, with its bridge crossing the Nahe, which running at right angles into the Rhine, here delivers up its waters. The difference in cast of colour between the two rivers at their point of meeting is very remarkable, the Rhine being clear and green, the Nahe a deep muddy brown; however, they no sooner enter the chasm in the Taunus hills, than the distinction is annihilated in the violent hubble-bubble commotions which ensue. The view beyond these home objects now attracted my attention. The Prussian hills opposite were richly clothed with wood, while on their left lay prostrate the province of Darmstadt, a large brown flat space studded, as far as the eye could reach; with villages, which, though distinctly remarkable in the foreground, were yet scarcely perceptible in the perspective. Behind my back was the duchy of Nassau, with several old ruined castles perched on the pinnacles of the wood-covered hills of the Niderwald.

The endless succession of ancient dilapidated castles which impart such "a Gothic and poetical interest" to the banks of the Rhine, have been generally spoken of by travellers with all the rapture of romantic enthusiasm; but there are some writers who have viewed them in a light rather colder but more correct As mere objects in the scenery, they are not the most attractive sort of castellated ruins;—the eternal round tower, or "stone cylinder," which generally stands out most conspicuously, is spoken of as the very reverse of picturesque:—

There is besides a moral feeling attached to them, (to quote the author of a *Family Tour*,) that is apt to carry the recollection back to those days of feudal tenure when murder and robbery were hardly considered as crimes; and when many an unhappy victim lingered out a miserable existence in the cells and dungeons of these ancient ruins, which still remain as memorials of the villainous scenes that have been transacted within their walls. A French writer, however, thinks otherwise; he tells us how delighted he feels in transporting himself in imagination to those remote ages of ancient chivalry—those ages, as he calls them, of valour and virtue—in imagining himself to be surrounded by those *preux chevaliers*, the protectors of weakness, the defenders of a sex which knew no other ornament but delicacy and gentility. Perhaps he would have been nearer the truth, if instead of preux chevaliers he had painted these castles to his mind as the retreats of bands of brigands.

This is unquestionably the less romantic, but by far the more correct mode of viewing the subject. We may be unwilling to adopt it always, because the attractions of chivalry are apt to captivate our imaginations, and the blessings which we fortunately enjoy under the present system of European civilization, leave us unable to estimate the weight of sufferings to which all peaceable persons were exposed in the age when it flourished. The very ruins that we speak of, themselves tell the tale of the oppression to which they were made subservient; in most cases the lords of these ancient castles provoked their destruction by their own rapacity. Some six or seven hundred years ago, instead of displaying their prowess against the Saracens and Turks abroad, they preferred the more profitable and less perilous occupation of pillaging poor merchants and peaceful towns at home; their feats in this line became at last so oppressive, that a general league was formed against them among their victims. The result of it was successful; the citizens were too strong for the knights, and the haunts of the "patrician highwaymen" were many of them burnt into the picturesque ruins, which, with a little aid from time, they still exhibit. Doubtless, in some cases, a castle may have been erected by its master to protect the traders—or (what was something gained) to secure them from being pillaged by anybody but himself; but, in all probability, for every one that was so built to foster the interests of commerce, there were a dozen devoted to the plunder of the poor merchants who were engaged in carrying it on.

None so little enjoy life, and are such burdens to themselves, as those who have nothing to do. The active only have the true relish of life. He who knows not what it is to labour, knows not what it is to enjoy. Recreation is only valuable as it unbends us; the idle know nothing of it. It is exertion that renders rest delightful, and sleep sweet and undisturbed. That the happiness of life depends on the regular prosecution of some laudable purpose, or lawful calling, which engages, helps, and enlivens all our powers, let those bear witness who, after spending years in active usefulness, retire to enjoy themselves,—they are a burden to themselves.—Joy.

To see nothing out what is good is impossible, and to say nothing but what is good would be deceitful; but it is the part of both wisdom and charity to see all that there is, and to say all that we can. There is a great deal of latent good which must be looked for before it can be found, but which is worth finding, and, therefore, worth looking for. —*Quarterly Review.*

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY.

No. X.

The Plagues of Egypt.

The portion of history on which we are about to enter has always been regarded of the highest importance. The signs and wonders which God "multiplied in the land of Egypt," (Exod. vii. 3,) were so stupendous in their nature, and decisive in their character, that they have ever been the first objects of attack by the sceptic and the infidel. On this account we shall a little enlarge the scope of our illustrations, and combine with the monumental records those independent traditions of Arabia which have been preserved in the Koran and the early Saracenic histories. It has been asked, why memorials of such great events as the ten plagues have not been discovered on the Egyptian monuments? we have anticipated a decisive answer by showing that the objects of divine vengeance were not the native Egyptians, but an intrusive race of conquerors; and this view of the case is confirmed by the Arabian writers, who declare that the Pharaoh by whom the Israelites were persecuted, was a chieftain named Walid, of the house of Amalek. There can be no doubt that the different wandering tribes of Western Asia, frequently united in their plundering expeditions into Egypt; and whether Pharaoh the Fourth was an Amalekite or not, the fierce animosity of the Amalekites against the Israelites is in a great degree explained by the tradition that the deliverance of the latter precipitated the overthrow of the empire which the house of Amalek had established in Lower Egypt.

The narrative of the Grecian historians confirms this explanation; they tell us that the expulsion of the Hyksos from Lower Egypt was accomplished by one of the Theban kings, but they do not explain by what event the foreign conquerors were so weakened as to become the prey of those over whom they had triumphed so recently and so decisively. The only plausible reason that can be assigned for the sudden prostration of the Hyksos, is the overthrow of Pharaoh's host in the Red Sea; after such a calamity the intrusive conquerors must have been unable to maintain their ground, and must have been as decisively vanquished as the monuments represent them to have been. National vanity induced the Egyptians to suppress the fact that God's interference in behalf of another people was the chief cause of their national triumph; just as, in modern times, in many Russian accounts of the battle of Pultowa, the defeat of Charles the Twelfth is ascribed wholly to the prowess of Peter the Great, and not a word is said of the intense frost which had previously destroyed the flower of the Swedish army.

This view of the case serves also to explain another objection very frequently urged by infidels, the absence in Scripture of any reference to the name and conquests of Sesostris; but if the preceding reasoning be correct, that mighty victor must have acquired his trophies while the Israelites were wandering in the desert, and necessarily removed from his line of march. It is, perhaps, no groundless conjecture, that God designedly placed his chosen people in sequestered security, while the Egyptian victor pursued his rapid career and prepared the way for more permanent conquests.

When Moses and Aaron were sent to bear the message of Jehovah to Pharaoh, each held a rod, which seems to have been a symbol of priestly dignity among the Egyptians, as it is still among many oriental nations. The Arabian traditions respecting this rod are manifestly borrowed from the fables of the Talmud, but they are so far worthy of notice, as they prove that a rod was considered the ensign of a prophet or an inspired person, for they say it was given to Moses by his father-in-law, Shoaib or Jethro, whom all the traditions represent as a preacher of the true religion.

The figure of Ammon, a well-known Egyptian deity, in the accompanying engraving, bears in the right hand the sacred *tau*, supposed to have been the symbol of vital energy, and in the left a rod or sceptre, such as we may suppose Moses and the Egyptian magicians to have used, especially if, as seems exceedingly probable, the Egyptian magicians belonged to the sacerdotal caste. When Moses and Aaron appeared before Pharaoh, the latter "cast down his rod before Pharaoh and before his servants, and it became a serpent." We have already seen from the monuments that something of a sacred character was attributed to serpents by the ancient Egyptians, and that the first appeal made to Pharaoh was consequently the most likely to influence his decision.

"Then Pharaoh called also the wise men and the sorcerers; now the magicians of Egypt, they also did in like manner with their enchantments." (Exod. vii. 11.) There are three different words used here to designate the Egyptian enchanters,—*chakamím* which simply signifies "wise men," but in Scripture is usually confined to those who attend in royal courts; *mekashephím*, which signifies "mutterers of incantations," and comes from a root primarily signifying "to pray;" but this root and its derivatives is restricted in Hebrew to idolatrous services; and *chartummim*, which is derived from a word signifying "engraving," and therefore most probably means "persons skilled in hieroglyphics." The word *lehatim*, translated "enchantments," also signifies "flames," and this we shall see is of some importance in examining the character of the magicians.

It deserves to be remarked in the first place, that all the eastern traditions concur in representing the wonders of the Egyptian magicians as pure deceptions. This is the express testimony of the Talmud

and the Koran. Such arts might not easily have been imposed upon a native Egyptian, but a barbarous foreigner like the Pharaoh of the Hyksos, might easily have been duped by the superior skill of "wise men" instructed in the knowledge and arts of the Egyptians. When the descendants of Timúr established their empire at Delhi, they were similarly dazzled by the tricks of the Hindú conjurors. The Emperor Jehangueir informs us, that even his father, the enlightened Akbar, consulted some of these soothsayers before setting out on an expedition, and found their predictions verified by the event. He also gives us the particulars of an exhibition in his own court by some jugglers from Bengal, which far surpasses that of the Egyptian sorcerers in the court of Pharaoh. The following extracts from the emperor's autobiography, cannot fail to interest the reader.

They (the jugglers) took a small bag, and having first shown that it was entirely empty, one of them put his hand into the bag; on withdrawing his hand again, out came two game cocks of the largest size and great beauty, which immediately assailing each other, fought with such force and fury that their wings emitted fire at every stroke. This continued for the full space of an astronomical hour, when they put an end to the combat by throwing a sheet over the animals. Again they withdrew the sheet, and there appeared a brace of partridges with the most beautiful and brilliant plumage, which immediately began to tune their throats as if there were nothing human present; pecking at worms with the same sort of chuckle as they are heard to use on the hill side. The sheet was now thrown, as in the other instance, over the partridges, and when again withdrawn, instead of those beautiful birds, there appeared two frightful black snakes with flat heads and crimson bellies, which with open mouth and head erect, and coiled together, attacked each other with the greatest fury, and so continued to do, until, as it appeared, they became quite exhausted, when they fell asunder. The sheet was thrown over as before, and when finally withdrawn, there appeared not a vestige of the snakes nor of anything else.

One of the seven men stood up before me (says the emperor,) and setting open his mouth, out came the head of a snake. Another of the men seized the snake and drew it out by the neck to the length of four cubits. This being disposed of by casting it to the ground, another followed in the same manner, and so on to the number of eight, none of them being less than four or five cubits in length. These being all cast loose upon the ground, were immediately seen writhing in the folds of each other, and tearing one another with the greatest fury; a spectacle not less strange than frightful.

It would be no difficult matter to collect numerous anecdotes of the wonders performed by the conjurors and snake-charmers of the East; some of which even now puzzle enlightened Europeans, and consequently may well have deceived such a prince as the fourth Pharaoh. But the miracle wrought by Moses was uncontrovertibly proved to be supernatural, for Aaron's rod swallowed up the rods of the magicians.

Untaught by this unequivocal manifestation of the Divine power, the wicked ruler of Egypt refused to let the Israelites depart, and the first plague was inflicted both as a chastisement and a warning:—

And Moses and Aaron did so, as the Lord commanded; and he lifted up the rod, and smote the waters that were in the river, in the sight of Pharaoh and in the sight of his servants; and all the waters that were in the river were turned to blood. And the fish that was in the river died; and the river stank, and the Egyptians could not drink of the water of the river; and there was blood throughout all the land of Egypt. (Exod. vii. 20, 21.)

The most striking monument of the severity of this plague is the river itself. From the earliest ages the Nile has been the great source of support to the inhabitants of Egypt; by its overflowings the land is fertilized; in every season its bed is nearly full, and its inundations occur at the period of the year when the heat of a scorching sun has dried up all other streams. In most lands, the overflowing of a river is the signal of wide-spreading calamity, and diffuses universal consternation; the overflowing of the Nile, on the contrary, is the announcement of fertility to all who dwell upon its banks; the rising of the waters is hailed by benedictions, thanksgivings, and songs of triumph; even the slave bowed down by toil, and the Fellah sinking under oppression, share the general joy, and for a day forget the cruelties of man in contemplating the bounties of nature. The ancient Egyptians ascribed a divine origin to the river, believing it an emanation from Knouph, or Cneph, whom they regarded as the father of the gods; and on one of the monuments, that deity is depicted pouring forth water from a vase, as a type of the inundations which were to fertilize the land. Even at the present day, many of the native Egyptians, both Christian and Mohammedan, believe that the Nile flows from the terrestrial paradise, while others think that it is a copy of a celestial Nile which flows through the mansions of the blessed.

The waters of the river are supposed to be peculiarly wholesome and sweet; indeed, the Turks frequently stimulate themselves to artificial thirst by eating salt, in order that they may drink the more of this delicious beverage. All travellers, ancient and modern, unite in praising the water; it is even asserted by some, that it has valuable medicinal qualities, and that the cattle which drink of it become more fat and more fruitful than those fed on the banks of any other river. A river so justly valued and even revered as a divinity, was now rendered an object of disgust and abhorrence; it is therefore impossible to conceive a miracle more striking or more likely to effect the purpose for which it was designed.

ON WRITING MATERIALS.

No. III.

The History of a Black-Lead Pencil.

There are probably but few of our readers who imagine, while using a black-lead pencil, that that useful little instrument is, and long has been, a source of much wealth to some of our countrymen. Such, however, is the case; for nearly three hundred years, the black lead (the essential part of a black-lead pencil,) has been derived from our own mineral treasures in a state of greater purity, and in more abundant supply than in any other part of the world. It is a remarkable circumstance in the mineralogical history of our globe, that almost every substance which is useful to man, appears to have some particular locale in which it is found more abundantly than at any other spot. This locality, therefore, becomes the mart from which other nations are supplied; until at length, a new deposit, or a new mine, is discovered in another place, and draws away, and often with ruinous effect, the traffic from the before-favoured spot. Black lead, for instance, has been found in many parts of the world, in a state of greater or less purity; but when the celebrated Borrowdale mine*, in Cumberland, was discovered, the others shrunk into insignificance, and the "crayons d'Angleterre" have become the standard of excellence all over the Continent. It has lately been stated in an American scientific work, that a black-lead mine was worked in Massachusets by the French residents about a century ago; but it was long abandoned, and has only recently been prosecuted, but with such success that it promises to yield a very abundant supply.

* See *Saturday Magazine*, Vol. I., p. 24.

In order to give a tolerably complete history of a black-lead pencil, we will first describe the materials used, and then the process of manufacture. In the first place we must state, that black-*lead* pencil is altogether a misnomer, there being not a particle of lead in the manufacture. The marking material is plumbago, or graphite, a compound of carbon and iron, in the proportion of nine parts of carbon to one of iron. This mineral is of a dark iron-black colour, passing into steel gray. It occurs in a massy form, in kidney-shaped lumps, varying from the size of a pea to much larger lumps, and is found in beds of quartz, and in masses of calcareous earth. It has a glistening metallic lustre, and the fracture presents a texture somewhat between scaly and granular. The large masses are slaty in their appearance, and occur generally in distinct concretions. It takes a considerable polish by rubbing, and, as is well known, gives a dark lead-gray streak when drawn along paper or wood. It is unctuous to the feel and not very brittle, and about twice as heavy as its own bulk of water. The large quantity of carbon which it contains, renders it peculiarly fitted to the purposes of the chemist, in the form of crucibles, as it will bear an intense heat. The other purposes to which it is applied, are to relieve friction in the axes and pivots of wheels. Its power this way may be illustrated by rubbing a button first on a plain board, five or six times, and applying it to a bit of phosphorus, the latter will immediately burn. When rubbed on a surface covered with plumbago, double or treble the friction will be required to produce the same effect. Plumbago is also used to give a polish to shot and gunpowder, to give a preservative coating to cast iron, and to mix with clay to form a lining for furnaces. At North Carolina shingles are coated with a mixture of black lead and oil, which is said to be an excellent preservation against fire. For all these latter purposes, however, coarse and impure black lead is employed.

Borrowdale, to which we have alluded, is situated in the heart of the lake district of Cumberland, a district which, for natural scenery and for poetic association, connected with the eminent men who have lived, and still live there, is a favourite spot with English tourists. In the reign of Elizabeth there was a mine of copper and lead in the immediate vicinity, which was worked by some Germans; but on finding some small veins of gold and silver in the mine, a contest arose with the crown as to who should possess the precious metals; Elizabeth gained the contest, and the Germans soon afterwards left the country. About that period, however, the Borrowdale black-lead mine was discovered, and soon drew attention to its valuable contents. Its celebrity gradually increased, and with it an extensive system of purloining. Sometimes the workmen in a neighbouring mine would cut through into the black-lead mine and carry off quantities of the contents. At another time a party of miners overcame a guard placed at the entrance of the mine, and kept possession of the whole place for several days. An Act of Parliament was obtained in the last century, inflicting severe penalties on all depredators, and since then an improved mode of protection has been devised.

The mountain which contains this valuable mine, is situated at a few miles from Keswick, and is about 2000 feet high. The entrance to the mine is about 1000 feet from the level of the ground, from which spot there is an excavated cavity, extending 660 feet horizontally into the body of the mountain; this passage has a railway laid along its whole length, and is used to convey the ore from the bowels of the mountain to the entrance

A few particulars concerning this mine were given by Campbell, in his Political History of Great Britain, about fifty or sixty years ago. He says,—

The mine before mentioned is private property, is opened but once in seven years, and the quantity known to be equal to the consumption in that space sold at once; and as it is used without any preparation, it is more valuable than the ore of any metal found in this island. But there is nothing improbable, and much less impossible, in supposing that other, and it may be many other, uses will be discovered in medicine, painting, dyeing, varnishing, or pottery, which would certainly contribute to raise the value of a mineral peculiar to this country, and with the nature of which, though so long in our possession, we are still so imperfectly acquainted.

Some part of this surmise has been realized since Mr. Campbell's days, and it may all be so. By far the best account of this mine which we have met with is that of Mr. Parkes, who visited it in 1814.

There are two entrances to the mine,—a small one by which the workmen descend by means of a flight of steps, and the other is a large horizontal one, capable of admitting hand-carts and wheel-barrows for the removal of the rubbish and loose earth by which the black lead is enveloped, and through this entrance the water passes off which constantly runs through the mine.

In order to secure the vast treasure which is contained within this mountain, the proprietors have now erected a strong brick building, consisting of four rooms on the ground floor, one of which is immediately over the opening by which the workmen enter the mine as they go to their work. This opening is secured by a trap door, and the room conected with it is called the dressing room, for when the men enter it, they strip off their usual clothes, and each of them puts on a dress suitable for working in a mine. The men work six hours each, and then they are relieved by others.

As the black lead is cleaned, it is put into firm casks which hold about one hundred and twelve pounds each, and these are sent by waggon to the warehouse of the proprietors in London. Formerly, this mine was opened but once in seven years: but in consequence of the demand being greater, and the quantity which they have discovered not being so large, it has been found expedient to open it and dig for ore during six or seven weeks every year. During this time the mine is guarded night and day. In consequence of the mines having been opened in late years every Summer, they now raise all the black lead they find, and then the mine is securely shut in the following manner:—The workmen wheel back the rubbish which had been removed at the opening of the mine, and this is laid on in a continued heap, to the amount of some hundred cart loads, which securely blocks up both the passages into the mine. The door is then locked as well as the door into the house, and all the men thus leave the premises in a state of safety; for the mass of rubbish which is thus wheeled in at the large door, dams up the small rill of water which usually flows through the mine, and thus has the effect of flooding it completely. Thus, if an attempt were made to break the house and enter the mine by that road, the robbers would find that the water had risen to such a height as would drown any individual who should attempt to search for the ore.

Our readers may be surprised at the extreme caution displayed in every part of these processes, as described by Mr. Parkes, to prevent purloining, &c., but this surprise will cease when we recollect the value of the ore; the market price of the best black lead being nearly half the price of pure silver, about two guineas per pound. Various shafts are excavated in this mine, some of which appear to be exhausted, which occasions a search for new veins in other directions. One mass was discovered in 1803, measuring twenty-one yards and a half in length, and two and a half in diameter.

The property of this mine is shared between a a few individuals, and to show its great value, Mr. Parkes states that in sixteen years, from 1798 to 1814, 2552 casks, of one hundred and twelve pounds each, were procured from this mine: of which 736

were fine, and 1816 coarse. This we shall find to give an average, one year with another, of 17,864 lbs.; indeed, the nett profits have been known to be between 20 and 30,000*l.* in one year. The reason why this mine is so particularly valuable, is to be found in the circumstance that the ore requires scarcely any labour to fit it for the market, it being originally almost in a pure state.

Perhaps one of the most remarkable circumstances connected with plumbago is the mode in which it is sold. After the quantity necessary for supplying the market during the ensuing year is extracted from the mine, and the latter closed up, the product is carried in small fragments of about three or four inches long, to London, where it is exposed for sale at the black-lead market, which is held on the first Monday of every month, at a public house in Essex Street, Strand. The buyers, who amount to about seven or eight individuals, examine every piece with a sharp instrument to ascertain its hardness, those which are too soft being rejected. The individual who has the first choice pays forty-five shillings per pound, the others thirty shillings. But as there is no addition made to the first quantity in the market during the course of the year, the residual portions are examined over and over again, until they are exhausted.

Thus much for the black lead. The wooden case or exterior of black-lead pencils is usually made of cedar. Of cedar-trees there are many varieties, but the red cedar used for pencils is the Virginian cedar, (*Juniperus Virginiana,*) of North America.

To prepare the cedar for the pencils, it is cut by a circular saw into four-sided strips of a proper length, and are so arranged as to thickness that two of them together form a square of which one piece is thicker than the other, so as to admit the groove cut to receive the lead, to be confined to one piece only—this groove being made by a common plough plane.

The lumps of plumbago are cut into slices about the thickness of a shilling, by a thin circular saw; the slices being of various sizes, from one to two inches long, and varying in breadth.

In preparing the cylindrical leads for the "patent" pencil cases, for which Mr. Mordan took out a patent, the plumbago slices are cut into square prisms a little larger than are ultimately required; and these prisms are brought to the desired cylindrical form by a gradual process of change, produced by an ingenious contrivance. A series of three different sized circular holes are cut in pieces of ruby; the first of which is of such a size as to convert the square prism of black lead into an eight-sided prism, by cutting off the sharp edge: this eight-sided prism is then converted into one of sixteen sides, by thrusting it through the next smaller hole: and lastly, the cylindrical form is given by the third hole which is just the size required. The manner of thrusting out the lead in a "Mordan's" pencil-case with a little pin inside, will give a good idea of the action of the wire and tube in the above process.

The rubies are worn out in three or four days. Steel does not last above as many hours. So that the ever-pointed pencils are necessarily costly, six of them being sold for 2*s.* 6*d.* If they are cheaper than this we may be sure that they are adulterated. In Paris, when you buy a sheet of paper in a stationer's shop, some of these pencils are added to the purchase. Now these are formed of a mixture of plumbago, fuller's earth, and vermicelli.

There is no patent which has been more infringed on than that of Mordan's, for ever-pointed pencils. Birmingham is the source of this infringement, where they are sold as low as three farthings each, formed of composition. A thousand persons are now engaged in the manufacture of these pencils and cases.

To return to the cedar pencils:—One edge of a slice of plumbago being made straight and even, it is dipped in glue, and inserted into the groove cut in the thicker half of the cedar stick. With a sharp tool a cut is made on each surface of the slice, close to the wood, and the piece can then be broken off, leaving a little prism of lead in the groove. The straight edge of the slice is again dipped in glue, and inserted at the end of the first piece, and again cut off, till the whole length of the groove is filled. The surface of the wood is then smoothed down level, and the other half is glued on, thus making a square black-lead pencil.

The square pencil is brought into the cylindrical form by passing it through a hole in an iron or steel puppet of the exact size of the pencil, and forced along by the workman. On the other side of this puppet is a revolving apparatus, which cuts the pencil round; it consists of two guages and a small plane iron, revolving round an open centre. Beyond this is a cylindrical hole in a steel plate; as soon, therefore, as the first edge of the pencil is cut round, it is forced into this circular hole, and before the workman has lost the means of pushing it forward at the end that is square, the cylindrical end is pushed through the circular hole, so as to enable him to seize it with a pair of wooden nippers. It is thus pushed and drawn entirely through, and comes out cylindrical and polished, for the hole being a little smaller than the pencil, the latter is compressed in the act of passing through.

The pencils usually hawked about the streets of London are made with the powder of black lead, mixed with melted sulphur, and then poured into moulds, which are frequently reeds or rushes. Common carpenter's pencils are formed in this way, and answer well enough for the purposes to which they are applied. This mode, however, relates to those common pencils in which the lead (so called) is unusually thick; but the most successful attempt at deception is where the pencil has all the outward form and semblance of being well made, but where a process of anatomization shows the purchaser that the amount of black lead is marvellously small,—the central part of the groove being filled with a different substance. In common pencils, gum-arabic and resin are often mixed with the plumbago.

Genuine cedar pencils must cost at least sixpence each. Pencils of a spurious kind are, however, sold as low as 4½*d.* per dozen. The melting or softening of the lead when held in a candle, or applied to a red-hot iron, and yielding a blueish flame with a strong smell like that of burning sulphur, will at once detect the nature of their composition. Pencils so made are of a very bad kind; they are hard, brittle, and do not cut or make a mark freely, either on paper or on wood, rather cutting or scratching them than leaving a coloured stroke.

Drawing pencils are distinguished by the hardness or softness of the selected specimens of plumbago from which they are manufactured, and, accordingly, those made from the hard mineral, have H or H H stamped upon the cedar, and those of a soft or very soft nature are distinguished by B or B B, technically, however, B and double B, as in the former case H and double H.

Black-lead pencils appear to have been known for nearly two centuries, for a writer of about 200 years ago, says,—"Of late black lead is curiously formed into cases of deal or cedar, and so sold as dry pencils something more useful than pen and ink."

NOTES ON FOREST TREES. No. XXII.

The Great-Flowered Magnolia
(*Magnolia grandiflora.*)

The different species of Magnolia form the most beautiful objects in the scenery of a North American forest: in their native country they well deserve the name of forest-trees, but in Europe they seldom attain a sufficient size to entitle them to any other appellation than that of shrubs.

The *Magnolia grandiflora*, the big laurel, or tulip-tree of the French Canadians,—but this last name is more generally applied to another tree, (*Lyriodendrum tulipifera,*)—is one of the most distinguished of its tribe. Of all the trees of North America, east of the Mississippi, the big laurel is the most remarkable for the majesty of its form, the magnificence of its foliage, and the beauty of its flowers. It claims a place among the largest trees of the United States, and sometimes, though rarely, reaches ninety feet in height, and two or three feet in diameter, but its ordinary stature is from sixty to seventy feet. Its trunk is commonly straight, and the summit is nearly in the shape of a regular pyramid. Its leaves are like those of a laurel, but much larger, being from seven to eight inches in length; they are glossy, evergreen, and of a leathery substance. The flowers are white, of an agreeable odour, and seven or eight inches in diameter; they are larger than those of any other tree with which we are acquainted, and on detached trees are commonly very numerous. Blooming in the midst of rich foliage, they produce so fine an effect, that those who have seen the tree in its native soil agree in considering it as one of the most beautiful productions of the vegetable kingdom.

The fruit is a fleshy, oval cone, about four inches in length; it is composed of a great number of cells, which, at the age of maturity, open longitudinally, showing two or three seeds of a vivid red colour. The seeds soon after quit the cells, and for some days remain suspended from the cone, each attached to the bottom of its cell by a white filament.

The wood of the Magnolia is white and soft, but much inclined to warp, especially if exposed to the weather; on this account it is only used in the interior of buildings. The beauty of this tree has caused its introduction into the shrubberies and parks of Europe, but it is rarely able to endure the severity of our winters, in the open air, further north than the south of England; and, as we have already observed, its appearance will never bear a comparison with its kindred in the American forests.

The beautiful genus contains many ornamental trees and shrubs which have been partially naturalized in the gardens of the milder parts of Europe, where they produce a pleasing effect by the elegance of their form, the shape and magnitude of their leaves, the sweet scent of their large and splendid flowers, and the brilliant colours with which some of them are decorated; the wood itself is partially aromatic. The leaves, in some species, remain on during the whole year; in others they are shed at the beginning of the winter. The name of Magnolia was given to these trees by Linnæus, in honour of a celebrated French botanist, named Peter Magnol, who flourished in the seventeenth century.

The Magnolia can be propagated by seeds, placed in a hot-bed under a frame; but as the seeds seldom reach maturity in our climate, the most usual method of producing new plants is by means of layers, which are prepared by covering the lower branches with earth. These trees succeed best in clayey ground, mixed with a little black mould.

THE ADVANTAGES OF A BOOK.

Of all the amusements which can possibly be imagined for a hard-working man, after his daily toil, or in its intervals, there is nothing like reading an entertaining book, supposing him to have a taste for it, and supposing him to have the book to read. It calls for no bodily exertion, of which he has had enough or too much. It relieves his home of its dulness and sameness, which, in nine cases out of ten, is what drives him out to the alehouse, to his own ruin and his family's. It transports him into a livelier, and gayer, and more diversified and interesting scene, and while he enjoys himself there he may forget the evils of the present moment, fully as much as if he were ever so drunk, with the great advantage of finding himself the next day with his money in his pocket, or at least laid out in real necessaries and comforts for himself and his family,—and without a headache. Nay, it accompanies him to his next day's work, and if the book he has been reading be anything above the very idlest and lightest, gives him something to think of besides the mere mechanical drudgery of his every-day occupation,—something he can enjoy while absent, and look forward with pleasure to return to.

But supposing him to have been fortunate in the choice of his book, and to have alighted upon one really good and of a good class. What a source of domestic enjoyment is laid open! What a bond of family union! He may read it aloud, or make his wife read it, or his eldest boy or girl, or pass it round from hand to hand. All have the benefit of it—all contribute to the gratification of the rest, and a feeling of common interest and pleasure is excited. Nothing unites people like companionship in intellectual enjoyment. It does more, it gives them mutual respect, and to each among them self-respect—that corner-stone of all virtue. It furnishes to each the master-key by which he may avail himself of his privilege as an intellectual being, to

> Enter the sacred temple of his breast,
> And gaze and wander there a ravished guest
> Wander through all the glories of his mind,
> Gaze upon all the treasures he shall find.

And while thus leading him to look within his own bosom for the ultimate sources of his happiness, warns him at the same time to be cautious how he defiles and desecrates that inward and most glorious of temples.—Sir John Herschel.

The books of nature and of revelation equally elevate our conceptions and invite our piety: they mutually illustrate each other: they have an equal claim on our regard, for they are both written by the finger of one, eternal, incomprehensible God.—Watson.

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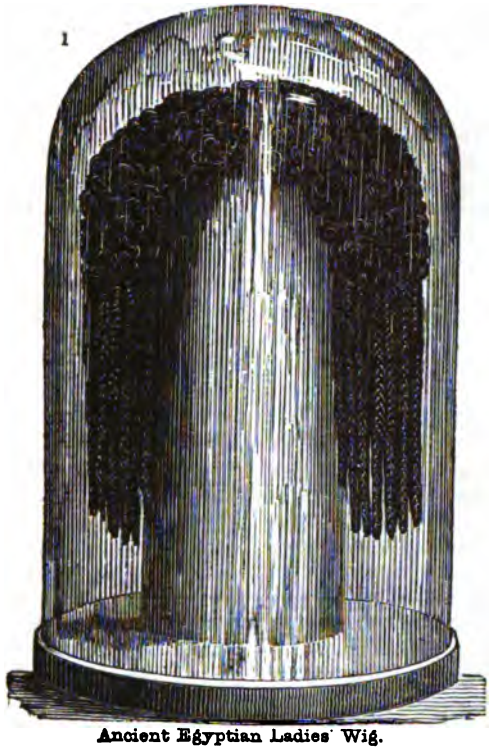
ON WIGS AND HEAD-DRESSES.

2

Roman Lady.



1

Ancient Egyptian Ladies' Wig.

4

Queen of Chas. I. of England.

3

Queen of Henry IV. of France.

5

Queen of Henry IV. of France.

6

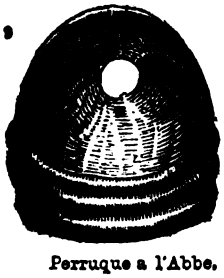
Perruque a deux Queues.

7

Perruque Naissante.

8

Perruque a la Brigadiere.



9

Perruque a l'Abbe.

10

Perruque en Bonnet.

11

Perruque a Nœuds

ON WIGS AND HEAD-DRESSES.

No. I.

THE custom of wearing false hair is of much more ancient date than is usually imagined; several of the nations of antiquity, when their riches and luxury were at the highest, were in the habit of adorning their persons by the addition of artificial tresses. It is likely that the ancient Babylonians employed the assistance of art in the arrangement of their hair, and perhaps wigs were not unknown to the fashionables of that day. That the art of wig-making had made considerable progress among the ancient Egyptians we are led to infer from the accounts of ancient historians, and the remains of Egyptian art which have been from time to time discovered; but the matter is now beyond all doubt, a perfect wig, which once belonged to an Egyptian lady, perhaps three thousand years ago, having been found in a tomb in the small temple of Isis at Thebes, in Egypt. This curious relic of antiquity, of which we give an engraving (No. 1,) is now to be seen among the remains of Egyptian art in the British Museum; its workmanship is excellent, and would not disgrace a modern *pérruquier*. The crown of the wig, as low as the ears, is entirely covered with small curls, while those portions which fall down over the shoulders are formed of a great number of small plaits of hair, each resembling the thong of a child's whip; the colour is nearly black, but it has a tinge of brown, which, perhaps, may be attributed to age.

Long hair appears to have been highly prized in the times we are alluding to, by the Jews in particular; but the habit of shaving the head, and supplying its place by artificial means, was one of the Egyptian customs, which they did not adopt during their bondage; on the contrary, they held it in utter contempt.

The Greeks and Romans, the latter people in particular, resorted to the use of artificial hair, although they did not exactly wear wigs. No. 2 represents the head-gear of a Roman lady; the men in general wore their hair short. The Roman ladies, says Strutt, not only anointed their hair, and used rich perfumes, but sometimes they painted it; they also made it appear of a bright yellow colour, by the assistance of washes and compositions made for the purpose, but they never used powder, which is a much later invention. They frizzled and curled the hair with hot irons, and sometimes they raised it to a great height by rows of curls, one above the other, into the form of a helmet; and such as had not sufficient hair of their own, used false hair to complete the lofty pile, and these curls appear to have been fastened with hair-pins.

Persons of rank had slaves to perform for them the offices of the toilet; they held the mirror (*speculum*,) in their hands themselves, to give directions; and Martial tells us, that if the slave unfortunately misplaced a hair-pin, or omitted to twist the curls exactly as they were ordered, the mirror was thrown at the offender's head, or, according to Juvenal, the whip was applied with much severity. It appears, indeed, that a number of women attended on these occasions, for no other purpose than to direct the operation. The married women used a kind of bodkin, which they managed very dexterously, to adjust and divide their hair into two portions, one turning to the right and the other to the left, and by this line of separation the married ladies were distinguished from those who were unmarried. The hair was adorned with ornaments of gold, with pearls, and with precious stones, and sometimes with garlands or chaplets of flowers; it was also bound with fillets and ribands of various colours. The ribands appropriated to the head-dresses of virgins differed from those of the married women.

With the decline of the Roman empire the practice of employing artificial hair fell into disuse, and we hear no more on the subject until about the year 1600; at which time it became the fashion in France to supply the deficiencies of a natural head of hair by artificial tresses, which were sewn on to thin sheep-skin, pared down to the pelt; then thin silk was used for the same purpose; and at last a complete peruke was formed. The word wig is evidently to be derived from the French name *pérruque*, which in some old dictionaries is spelt *perwicke*, thence *perlwig* and *wig*. The peruke was, in the first instance, intended to supply a natural deficiency of hair; but, in the end, this article of dress became so necessary to all who aspired to the name of fashionable, that the most beautiful head of hair was frequently sacrificed for the purpose of covering the head with a peruke.

The court of Louis the Fourteenth of France was looked up to, as the "glass of fashion," by the rest of Europe, and this affair of perukes was considered of so much moment, that the king licensed forty-eight *barbiers-pérruquiers* to make this important article for the court, and, at the same time, two hundred others to serve the commonalty. The business increased to such an extent, that the Minister of Finance became alarmed at the quantity of money which left the kingdom to purchase hair in foreign countries, and it was gravely deliberated, whether wigs should not be abolished by law, and caps established in their place; but the pérruquiers having proved, by statistical details, that the export of manufactured perukes produced a greater profit to the nation than the purchase of hair did loss, the wigs gained the day, and the manufacture increased so rapidly, that the number of licenses were increased to eight hundred and fifty, and the members were known under the title of *barbiers-pérruquiers-baigneurs-etuvistes*. They received letters patent, and their officers were hereditary; these consisted of a provost, wardens, and syndics. To this body of men, so essential to the members of fashionable life, the king gave the sole right of dealing in hair, either by wholesale or retail, of making and selling powder and pomatum, preparations to remove the hair, drops for the cure of the toothache, in fact, every application which was intended for the benefit of the head and face. The only parties who interfered with their exclusive privileges were the surgeons; to these men the newly-constituted company could not deny the use of the razor in shaving, for it was a surgical instrument, but to prevent their intermeddling with the art of hair-cutting, it was decided that the insignia of their callings should be different. The surgeon was to hang up for his sign a *copper* basin, and could only paint the front of his house either red or black; on the other hand, the pérruquier was to exhibit a basin of white metal, and could paint the front of his shop of any colour he chose, except red or black. The use of powder was not at first allowed, as the monarch had an antipathy to it, but at length he yielded to the wishes of his courtiers, and permitted a trifling quantity to be sprinkled even over his own perukes.

The expense of perukes in these days was so enormous, that some of the fraternity commenced dealing in second-hand articles, which they manufactured to look like new, and were able to sell at a reduced price. "It is true they were not very durable, but as

they resembled new articles, they were of great service to individuals whose fortunes were small." But to prevent abuse in selling second-hand wigs for new, the dealers were prohibited from establishing themselves in any other part of Paris except the *Quai de l'Horloge du Palais.*

Nos. 3 and 5 are from portraits of the queen of Henry the Fourth of France, and No. 4 from a head of the queen of Charles the First of England. During this period, and until the beginning of the eighteenth century, the men wore amazingly long heads of hair, spreading over the head and shoulders; but at this time hair-powder was used. Towards the close of the century, perukes of the strangest form came into fashion. To illustrate the subject we have selected six examples from French engravings, namely:—

No. 6, *la pérruque à deux queues*, is evidently intended for a man of fashion; No. 7, *la pérruque naissante*, half wig and half natural in its appearance, we may suppose worn by a young man; No. 8, *la pérruque à la brigadière*, was only worn by military men; No. 9, *la pérruque de l'abbé*, was worn by the lay clergy of France, who mixed more with society than the priests themselves; No. 10, *la pérruque à bonnet*, intended more for comfort than show; No. 11, *la pérruque à nœuds*, would become an elderly gentleman, but is more assuming than the last.

COINCIDENCES RESPECTING THE HARMONY OF INHARMONIOUS SOUNDS.

..... some perchance,
Rude singly, yet with sweeter notes combined
In unison harmonious.—GISBORNE.

But cawing rooks, and kites that swim sublime
In still repeated circles, screaming loud,
The jay, the pie, and e'en the boding owl
That hails the rising moon, have charms for me.
Sounds inharmonious in themselves and harsh,
Yet heard in scenes where peace for ever reigns,
And only then, please highly for their sakes.—COWPER.

..... The jay, the rook, the daw,
And each harsh pipe, discordant heard alone,
Aid the full chorus.—THOMSON.

The screams of the jay and the woodpecker, however discordant in themselves, or when out of place, accord admirably with the forest.—WHITE *of Selborne.*

Sounds do not always give us pleasure according to their sweetness and melody; nor do harsh sounds always displease. We are more apt to be captivated or disgusted with the associations which they promote, than with the notes themselves. Thus the shrilling of the *field-cricket*, though sharp and stridulous, yet marvellously delights some hearers, filling their minds with a train of Summer ideas of everything that is rural, verdurous, and joyous.—*The same.*

THE FOOT OF A HORSE is one of the most ingenious and unexpected pieces of mechanism in the animal structure, and scarcely yielding to any in regularity, and in complexity of parts, under simplicity of design. The hoof contains a series of vertical and thin laminæ of horn, so numerous as to amount to about five hundred, and forming a complete lining to it. Into this are fitted as many laminæ belonging to the coffin bone; while both sets are elastic and adherent. The edge of a quire of paper, inserted, leaf by leaf, into another, will convey a sufficient idea of this arrangement. Thus the weight of the animal is supported by as many elastic springs as there are laminæ in all the feet, amounting to about four thousand; distributed in the most secure manner, since every spring is acted on in an oblique direction. Such is the contrivance for the safety of an animal destined to carry greater weights than that of its own body, and to carry those also under the hazard of heavy shocks.—MACCULLOCH.

THE THERMOMETER-STOVE.

A BOOK has lately been published by Dr. Arnott, *On Warming and Ventilating*, the principal design of which is to communicate to the public instructions for making and using what is called by the inventor *A Thermometer-stove.* This stove possesses many valuable properties, and will, unquestionably, be the means of effecting some extraordinary changes in the domestic habits of the people of this country. As it stands associated with one of the most ordinary, but at the same time important, operations on which individual and social health and comfort depend, we present to our readers the following particulars.

Dr. Arnott is well known as an eminent physician, a popular writer, and a practical philanthropist. He has already gained the thanks of the medical profession by permitting the unrestricted use of his *water-bed*, and in the present instance is equally entitled to the respect and gratitude of all classes. The Thermometer-stove is equally adapted for the cottage and the mansion, and with a liberality which does him honour, its inventor has given to the public the full benefit of his labours.

Before we describe Dr. Arnott's stove, let us offer a few brief observations on the two modes of heating, which, for domestic purposes, are those generally adopted in our own country. And first of all, we refer to the *open fire-place*, in which peat, wood, or coal, are used as fuel.

For the sake of more simple illustration, we limit our remarks to an open coal fire; the kindling of which is a somewhat tedious and wasteful process. But let us suppose the fire to be perfectly alight and burning briskly. It surely cannot escape observation that a valuable portion of the fuel is passing away unconsumed, namely, that which ascends the chimney in the form of smoke. At certain intervals, the fire of which we speak requires poking, trimming, and refreshing, by additional supplies of fuel. If it happen that we have a good fire, when fresh fuel is laid on, the waste will bear some proportion to the quantity of ignited fuel already in the grate as compared with the fresh supply. Sometimes the latter will be speedily vaporized, as when we have a blazing fire; at other times waste will occur by coal falling through the grate before it is properly ignited; whilst it not unfrequently happens, that by fuel injudiciously applied, either as respects the mode or the quantity, a good fire is suddenly converted into a dull one, which, unless carefully tended, will soon be extinguished.

On a moderate calculation, it is estimated that, from the causes just mentioned, one-fifth part of all the coal used for domestic purposes is lost to the consumer. And this is unavoidable even with careful management. Where cinders and small coal are thrown on the ash-heap, the proportion is, of course, much greater.

But the waste of *fuel* is a trifling consideration in comparison with that of *heat.* The abundant supply of coal with which in this country we are favoured, and its consequent cheapness, is one of the principal causes of the long-continued use of an open fire. Far be it from us to undervalue the comforts of an English fire-side, or to appear insensible to the many delightful associations connected with it. The existence of these we admit, as we do also their influence upon the national character. But dismissing our prejudices on this subject, we believe it will be found that the advantages of an open fire are not so great as we imagine, and that even its comforts are pretty equally balanced by its inconveniences. Hence we cannot but venture the opinion, that, by and by, we

(or at any rate our successors) shall become equally attached to more rational and more economical modes of warming as we are now to those in common use.

We have said that the waste of *heat* by an open fire greatly exceeds that of fuel. In an ordinary fire-place, whatever be its form, the quantity of air which passes by, or over, the fire is much greater than that which passes through it. We need hardly remark that the combustion of the fuel depends on an uninterrupted supply of air, and the more rapidly the air circulates amongst the ignited fuel, the greater is the quantity of heat liberated in a given time.

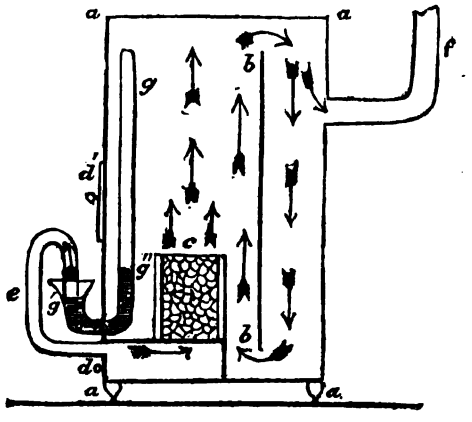
A condition essential to the operation of an open fire is, that it be placed almost immediately under a flue communicating with a chimney, which flue must, in some respects, correspond with the size of the fire-place. To insure sufficient draught in the flue to make the fire burn, and to carry off the smoke, a current of hot air must be constantly ascending it. Any defect in this part of the process occasions what is very justly considered a nuisance, namely, a smoky apartment. To the situation of the fire, and the quantity of air permitted to pass over it, may be attributed the loss of heat of which we complain. Under the circumstances just described, the heat which enters the room is only what is radiated from the front of the fire. By its means the air immediately surrounding the fire has its temperature raised, but the moment the door of the apartment is opened, the air thus warmed is propelled into the chimney, and several minutes must elapse before the air which gained admittance will be warmed to the same temperature as that which was so suddenly driven out. Hence it is, that however comfortably an apartment may be fitted up, if it be warmed by an open fire, the temperature of the air within it is partial and unequal. We naturally turn towards the fire for warmth; but who can deny that the nearer they approach the fire the more difficult is it to keep warm that part of the body which is turned away from it?

In the best constructed houses, the crevices in floors and around doors and windows permit the entrance of more air than, under ordinary circumstances, is sufficient for all the purposes of warming and ventilating. The quantity of air required for the combustion of fuel, when that fuel is economically employed, is almost inconceivably small. But in an open fire-place, in proportion that the fire is enlarged, so much the more rapid will be the motion of the hot air in the chimney; a process which necessarily implies the access of an equal quantity of cold air to the room. Thus we may often notice when there is a large fire in a room, the air will make a *whistling* sound in passing through a key-hole; but the sound ceases when the intensity of the fire has abated. It can be satisfactorily proved, that by an open fire, at least three-fourths, and in many cases, seven-eighths, of the heat produced from a given quantity of fuel are absolutely wasted by being permitted to ascend the chimney.

Another mode of heating, and which is adopted very generally in entrance-halls, shops, offices, and public buildings, is by means of the *hot-air stove*, which consists of an enclosed fire-place surrounded at the back and sides by an iron case, between which and the fire-place air is permitted to circulate, and consequently becomes heated. By this stove less heat is wasted than in an ordinary fire-place, but there are several objections to its use, of which we mention the following.

The hot-air stove requires a good deal of attention: almost as much as an open fire. It is liable to be heated red-hot; the salubrity of the air which comes in contact with it being thereby impaired, whilst an odour peculiarly disagreeable is diffused throughout the apartment in which it is placed. There is danger attending the use of this stove, unless the pipes by which it communicates with a chimney or the external air are fixed at a proper distance from wood and other inflammable materials. To the neglect of this necessary precaution, in conjunction with carelessly over-heating stoves of this kind, we may attribute some of the most extensive fires of recent occurrence.

The stove invented by Dr. Arnott differs essentially from the common hot-air stove, and still more from an open fire-place. But let us describe it; and in doing that we shall find that the following sketch will materially assist us. It represents the stove with one of its sides removed, so as to exhibit its interior arrangements.



The outlines of the figure, *a a a a*, represent the case or body of the stove, which might be formed either of cast or sheet iron. It is divided into two chambers by the partition, *b b*; but in such a way that there may be a free communication at the top and bottom. *c* is a small furnace, or, as it is called by the inventor, a fire-box, made of iron, and lined with fire-bricks. The fire-box is not in contact with the exterior case of the stove. It communicates at the bottom with an ash-pit, the door of which is at *d*, —that of the stove, by which the fuel is introduced, is at *d'*. Both these doors must fit very accurately. Above the door of the ash-pit is a bent pipe *e*, by which air gains admittance to the fire.

A fire being kindled and the doors at *d d'* shut, the only way in which air has access to the fuel is by the pipe *e*; the air so admitted, passing through the fire before it enters the upper part of the stove. That portion of the air not required to aid the combustion of the fuel having reached the main body of the stove, and there mixing with the smoke and other products, they circulate slowly in the directions indicated by the arrows, and at length pass into the chimney by the pipe *f*.

The slow movement just mentioned as taking place within the stove may well be contrasted with what happens in an open fire-place. In one case the greater part of the heat produced is rapidly carried off by a current of air ascending the chimney—by the Thermometer-stove it is detained until almost the whole of it has been diffused throughout the apartment.

The bent tube *g* terminating in a cup-shaped opening at *g'*, is a self-regulating valve. The tube is closed at the end *g* within the stove. *g' g''* represents mercury which occupies the bend of the tube. When the fire in the stove burns too briskly, the air in the tube occupying the space between *g* and *g''* is ex-

panded, and by expelling some of the mercury from the tube at g'' into the cup at g', it closes the aperture of the pipe e; thus cutting off the supply of air to the fire. In a few minutes (the fire in the mean time having abated its energy,) the air in the tube will return to its former dimensions, and the mercury subsiding in the cup, air is again permitted to enter the ash-pit.

The stove, of which we have thus attempted to convey a general idea, may be made of any required form or size. Instead of the self-regulating air valve just described, it is fitted up with others of a very simple construction, and which admit of being adjusted with the greatest accuracy by the hand.

We have seen Thermometer-stoves of various forms, some of them very beautifully designed, in operation. We have attentively watched the process going on within them, and have made ourselves acquainted with their capabilities as heating agents. The result of our observations leads to this conclusion; that if the Thermometer-stove be made in strict conformity with the plain and simple rules which are so perspicuously laid down by Dr. Arnott, it will prove one of the most economical as well as most useful inventions of this rapidly improving age.

Among the advantages of the Thermometer-stove, we may mention that it maintains an uniform temperature if required at night as well as by day, but which can be increased or diminished in a few minutes. The fire within it may be kept alight without requiring attendance or any additional fuel for ten, or even a greater number of, successive hours. To warm a moderate-sized room, the cost of fuel will not exceed a penny a day. No smoke, dust, vapour, or other products of combustion, can possibly escape into the room. The air is warmed, not heated, and hence it is not deprived of its health-preserving properties. There is no danger attending the use of the Thermometer-stove; it is more easily managed than an open fire; and there is no waste either of fuel or of heat.

He who can imagine the universe fortuitous or self-created, is not a subject for argument, provided he has the power of thinking, or even the faculty of seeing. He who sees no design, cannot claim the character of a philosopher: for philosophy traces means and ends. He who traces no causes, must not assume to be a metaphysician; and if he does trace them, he must arrive at a First Cause. And he who perceives no final causes, is equally deficient in metaphysics and in natural philosophy; since, without this, he cannot generalize,—can discover no plan, where there is no purpose. But if he who can see a Creation, without seeing a Creator, has made small advances in knowledge, so he who can philosophize on it, and not feel the eternal presence of its Great Author, is little to be envied, even as a mere philosopher; since he deprives the universe of all its grandeur, and himself of the pleasures springing from those exalted views which soar beyond the details of tangible forms and common events. And if, with that presence around him, he can be evil, he is an object of compassion, for he will be rejected by Him whom he opposes or rejects. —Macculloch.

Compassion.—Compassion is an emotion of which we ought never to be ashamed. Graceful, particularly in youth, is the tear of sympathy, and the heart that melts at the tale of woe; we should not permit ease and indulgence to contract our affections, and wrap us up in a selfish enjoyment. But we should accustom ourselves to think of the distresses of human life, of the solitary cottage, the dying parent, and the weeping orphan. Nor ought we ever to sport with pain and distress, in any of our amusements, or treat even the meanest insect with wanton cruelty.—Dr. Blair.

Honour.—He is worthy of honour, who willeth the good of every man; and he is much unworthy thereof, who seeketh his own profit, and oppresseth others.—Cicero.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT.

No. II.

FUNCTIONS OF THE EYE—ABUSE OF THE ORGANS OF THE SENSES—CAUSES BY WHICH THE EYE-SIGHT IS IMPAIRED.

Having already described the chief parts and functions of the eye, and its appendages, we come now to consider how it is that this apparently elaborate apparatus performs its office. A pencil of light, that is, a bundle, or collection, of rays proceeding from any luminous object, falling upon the cornea, enters it, and is refracted or bent in its passage through the aqueous humour, by which means the rays of the pencil are brought nearer to parallelism; such of the rays as can pass through the pupil are further refracted by the crystalline lens, and the rays are now no longer divergent, that is, they do not spread out *from* a point, but begin, in passing through this lens, to converge or proceed *to* a point, and this convergency is perfected by means of the vitreous humour, which brings the converging rays to a point exactly when they reach the retina. This process is undergone by every pencil of rays proceeding from any object to which the eye is directed, and an exact image of such object is depicted on the retina. If this convergent point do not quite fall upon the retina, but before it, in the vitreous humour, the eye is said to be short-sighted; if, on the contrary, these convergent points fall beyond the retina, the eye is then long-sighted; but these and other defects to which the eye is subject, will be discussed at greater length hereafter.

What we have above stated is the grand and important element in distinct vision; the convergence of the rays of a pencil to a point on the retina. An admirable adjustment of parts and of degrees of refractive power in the different humours of the eye produce this perfect convergency, and the mind can sufficiently appreciate and understand the mechanism and purposes of all this exquisite arrangement,—but here we have attained the utmost limit of our knowledge,—we have traced upon the retina a picture of the forms presented to the eye,—we see that this retina is an expansion of a nerve called the optic nerve, which proceeds from the retina into the brain, the seat of the mind;—but how the mind receives its impressions of light through the medium of this optic nerve, is a question that has never been answered, and probably never will be answered. The student in science is constantly presented with certain barriers beyond which he may not pass,—with certain limits to the inquiring powers of his mind, when subjects such as these are presented to him, which admit neither of demonstration or of analogical inference, and are therefore beyond the purposes of physical inquiry. Let him not, therefore, deal in vague conjectures, which, however ingenious, must still be unprofitable; but rather let him turn to the immense field which has already been cultivated so successfully, and from whence rich harvests of knowledge have been gathered. We cannot join in the utterance of the querulous opinion, which, because there is much that is unknown, denies the existence of any knowledge at all; nor could we ever assent to the conclusion of the philosopher, who said that his long life of study had taught him that he knew nothing; on the contrary, we can assure the reader, that the arena of modern science is so extensive, that a very long life and untiring industry, would be inadequate to a fair investigation of its contents.

The reader will now have some idea of the me-

chanical structure of the eye, and how, as far as we know, this structure assists the powers of vision. We come, therefore, to the more direct purpose of our subject, namely, the consideration of those employments of the eye by which its powers are impaired or destroyed. And here we must remind the reader of another law of nature as remarkable and beautiful as any one in her code, if we may be allowed such an expression, where all appear alike beautiful and remarkable when we are quite sure that we read and interpret them correctly; it is this—that the perfect action of all the faculties, whether mental or physical, can be assured and perpetuated only by allowing them certain periodical intervals of perfect repose. Now this may appear to be a truism, so perfectly well known, that the necessity for its enunciation in this place may be questioned by some: but we must remind our readers, that a principle is as important in its nature as it is unbounded in its application; that it is the business of science not only to discover principles, but to trace them to effects where their presence is, perhaps, in no way suspected; that we often recognise the action of a principle in a few effects to which we are most obviously exposed, but we are often slow to recognise the same principle in effects which afford us a larger amount of pleasure or profit on the one hand than of pain on the other, which minister to our cupidity, our pride, our vanity; or which flatter one of those "sins which do most easily beset us;" and, indeed, we are frequently unable, from ignorance of the extent of a principle, to apply it as a cause to effects, which we often think have no cause at all, or at least a very remote one, which, if discovered, we pronounce to be irremediable. But this sort of argument is unjust and unreasonable: in nature there are only a few principles or first causes; some of these we are cognizant of—to all of them we are subject: our business, therefore, is to study the code of laws by which we are governed, to conform with the strictest obedience, since rebellion meets with certain punishment, which, if ever it can be removed, is removed only by a return to obedience.

The senses, then, require perfect repose in order to their perfect action, and this repose implies a removal of every cause which excites them to action. By the perfect action of an organ, we mean its legitimate use and employment; the snuff-taker abuses his organ of smell, and its functions are manifestly impaired. The manufacturer of perfumes is a bad judge of odour from the same cause. A nauseous smell ceases to be nauseous unless it is judged of at intervals. The sense of hearing is subject to loss of power from abuse of its functions: a man accustomed to the din of noisy factories, and who sits down undisturbed by and even unconscious of the presence of that disturbance, which to a stranger is, at first, insufferable, is scarcely conscious of delicate sonorous impulses. Blacksmiths hear soft tones with difficulty, and examples have been abundant of old artillerymen who have become quite deaf from the long practice of their profession. The sense of touch is less perfect in the ploughman than in the watchmaker, and most perfect, perhaps, in the blind man, who by its means supplies in a great measure the loss of sight.

Taste also may be abused: the excited reveller scarce distinguishes the flavour of his "liquid fire," as the banquet approaches its end, and the pampered epicure is gratified only by allowing to his palate intervals of repose. The eye exhibits this principle in a beautiful manner. In its healthy state its function is being constantly intermitted in the process of winking, as also by moving it about towards different objects: if the eye be kept open and rigidly fixed upon one object, its visual power rapidly declines.

There is so much sympathy between various physiological structures, that it often happens that a morbid or diseased action of one structure will seriously interfere with the functions of other structures which are healthy. In the healthy eye, the retina, the crystalline lens, the ciliary nerves, and the pupil, must harmonize in their action: the many diseased affections of the organ which include weakness or indistinctness of vision, result from a weak state of the retina, from the disordered action of the iris and ciliary apparatus; this is brought about mainly by inflammation of the eye or its appendages, resulting from injudicious use of the organs.

To discuss all the diseases of the eye resulting from abuses of its function, is manifestly a subject for a large medical volume, the study of which belongs to the medical pupil alone:—our purpose is more confined: we intend to point out some of the cases of every-day occurrence, wherein the organ is injured by an habitual irritable treatment. We do not intend to employ technical terms, except a few, which may be necessary to the comprehension of our subject, and still less do we pretend to direct remedies, except by pointing out causes of injury to the eye. In most cases our purpose will be effected, when, having clearly traced an ill effect to its cause, we say, remove or mitigate the cause, and the effect will probably cease.

In the pathology of the eye the term *amaurosis* is employed, in which is comprehended all those imperfections of vision resulting from a morbid action of the sentient apparatus belonging to this organ. The term amaurosis is derived from a Greek word signifying *to darken*, and implies partial or total loss of vision, according as the optic nerve, or retina, is partially or totally paralyzed. This injury, or paralysis, is not generally manifested by external symptoms, and is therefore clearly distinguished from cataract, opacity of the cornea, and closed pupil. This disease is due to a variety of causes which it is not our business to discuss; such as disorganization of the retina, vascular turgescence, injury of certain nerves, &c. Our purpose is, as we have already stated, to point out those common causes, of every-day occurrence, which the exercise of many arts and professions is calculated to induce, and these causes may be conveniently arranged into five heads, namely:—

1st. Sedentary employments in which the head is bent over work of various kinds; including those cases in which the eye is customarily employed on minute objects.

2nd. Where the eye is employed upon too strong or too little light: upon polished or reflecting surfaces.

3rd. The habitual exposure of the organ to high temperatures.

4th. The habitual exposure of the eye to acrid fumes.

5th. The customary employment of optical glasses.

By the light of Divine revelation, Christianity enables us accurately to discriminate between good and evil, right and wrong: it teaches us to see things according to their own nature and in their proper colours: to behold those qualities which are really vicious, deprived of the dazzling brightness, wherewith reason, impaired by passion, had invested them; and to contemplate those which are virtuous, disencumbered from the clouds of worldly prejudice, and arrayed in their native beauty. In a word, it teaches us to see things, as they are in the sight of God, and not as they appear according to the erroneous conception of men.—BISHOP MANT.

ON THE PERPETUATION OF PLANTS.

THE care which the Creator has bestowed on the perpetuation of plants offers a wide field of inquiry. The collateral as well as the direct means of propagation are very numerous, and the results very extensive and valuable.

The circumstance which is, perhaps, most striking in the mode of propagation by seeds, is the apparent anxiety for their production, in the means adopted. This is less sensible to common observation, where the magnitude, the duration, and the uses of the plant itself, are conspicuous; but it becomes striking in the smaller and more perishable ones, and is often very remarkable in the lowest parts of the scale. Thus in the oak, we pay little attention to the production of seeds; or if noting it, we still know that there is before us a being, destined to a life of so many centuries, that we scarcely think of its death, or of the necessity of a system of perpetuation.

It is in the biennial and the annual plants that this anxiety for the continuation of the races is most obvious to common observation. Millions of individuals seem to be utterly worthless: and there are even species without end, for which we can discover no use, though desirous to find at least an insect attached to each. Amid the hundreds of lichens and mosses, a very few would, as far as we can see, have fulfilled the purpose which they appear solely to serve, in producing soils on naked surfaces. Yet in these we trace the same care and the same anxiety. The annual seems to grow for no other purpose than to produce seeds; and that being accomplished, it dies. For this it struggles against every difficulty: and under every check, every accident, every mutilation, it still labours for this end, as if it were a conscious agent. We cut off its flowers, or cut down itself, obstruct, impede it, in every manner, but it still resists, proceeding with an obstinacy of determination to effect this great object; while if, tired of opposing it, we cease, it recommences, and having at length gained its purpose, dies. We can often even prolong the annual life for another year, or more, by the same opposition; as if it was determined not to part with existence till it had obeyed its orders and fulfilled its destiny.

The first mark of care, if a remote one, is found in the contrivances for protecting the future flower through the Winter, wherever such protection is necessary. In the buds, the beautiful packing, the investing scales, the down or hairs in some cases, and the varnish in others, are familiar: and, by these contrivances, aided by that vital power, the action of which in resisting cold has not been explained, the most complete protection is afforded. In the bulbous-rooted plants, the bud is not less effectually protected beneath the ground, partly by the depth of earth, and partly by the singular chemical properties of the coverings, aided by the same resisting vitality.

In other cases, the flower bud is not produced till the frosts are passed; and our attention may now be directed to the provisions within it for the formation and ripening of the seeds. In a certain sense, indeed, the flower is a superfluity, an example of gratuitous beauty, while it also contains provisions for the feeding of insects; yet with these are always combined some uses for the seed itself, as, in many cases, they are so numerous and remarkable that they cannot be overlooked. The reader need only be reminded of the various ways in which they protect the essential parts of the fructification, the stamina, and the pistils, on which the future seed depends; and of the contrivances for bringing the pollen into contact with the latter.

The essential protection which the calyx affords, by enveloping everything while yet in a tender state, must not be forgotten; apt as we are to look on it as a superfluous part, from attending only to the expanded flower. It would be endless to point out the numerous forms and modes under which it guards the unopened flower, and above all from the access of water. The calyx of the rose, so useless when expanded, is a familiar instance of protection afforded by a structure which, compared to the purpose, is very inartificial; and yet in this, and all similar forms, that protection is complete. In the cistus, possessing a flower of unusual tenderness and delicacy, a varnish is superadded, for the purpose of warding off the rains. The monophyllous calyces present a structure more apparently efficacious, yet the protection is not more complete. And if the scale calyces of the grasses offer a much simpler contrivance, the security which they afford is not the less perfect. The calyx of the poppy is lax, and not very firmly closed; but as a counterbalance to this, the flower bud is bent down by a curvature of the stem, and erects itself only when the protection of this deciduous guard is no longer wanted. The obstinacy with which this bud refuses to flower till it can erect itself, belongs to a still more interesting circumstance in the physiology of plants: but under the present view, the inverted position enables the back of the calyx to ward off that water which might have penetrated the less perfect junction at the summit.

That provision may here be pointed out in the liliaceous flowers, which, as a sheath, forms the substitute for the absent calyx, while the leaves also are sometimes arranged to perform the needful function. Under many different modes, the tulip, the genus Allium, the grasses, and far more, will afford examples of protection, given either to supply the want of a calyx, or to add to the security which that affords. And thus the seeds of the mosses are so embosomed in the plant, at first, as almost to elude the botanist; while they escape the chance of injury; to be elevated for dispersation, only when all hazard of failure is past.

It is under all this care and concealment, that the essential parts, destined to produce the perfect seed, are growing within; free from all hazard, till the expanding flower opens to the light that the work may be completed. And then do we begin to perceive the utility of many other preparations towards this great end, the purposes of which we might not have understood before, and which he who looks on this interesting part of creation with a common eye, never sees. The vanity of philosophy may smile, if it pleases, at what it may choose to term fanaticism, but it is he who seeks for the hand of the Creator in every one of His works, who has found the true clue of investigation; since the purpose is that clue, and, that to study the design and the Designer, are one. And if the care of a parent for its offspring, the anticipations, the preparations, the watchfulness of a mother, are objects of our admiration, shall we not at least investigate the contrivances, the thought, the anxiety, of the Great Parent of all, for the safety and the life of these, His beautiful, but His lowest children; not inquire of his care for their perpetuity, that not one shall be lost? Could more have been done; and if He has not done it, by whom then was it effected? Who is it that contrived, who is it that watches over the lilies of the field, that not one of them should perish from his land? Who is it that guards to maturity, even the minutest moss, and ensures it a posterity, that it shall not fail from the multitude

of His children, who, even in the vegetable world, look to Him for their food, their life, and their enjoyment? Was it He: and is it He who cares not for man, provides not for him, governs him not, watches him not? Be it so, if it can afford satisfaction to think that so it is: but it will not be so to him who will open his eyes on the world around him, and who has learned, in everything, to look to the Cause, the Parent, of the universe. Would that I could persuade him who has hitherto walked through creation without eyes, without thought, without a heart, to take into his hand the first flower that shall present itself, and examine it as the work of some Being at least who intended, and wrought, and cared. If eloquence has long done its worst for this unfortunate cause, there must be one who can sit down with the next flower that meets him in his Summer walk, and ask himself, Whence came this, why is it here, why all this beauty, why all this care? I have seen it rise from a minute seed, I trace a series of cares and contrivances that seed shall spring from it again, I trace these under a thousand forms, I marvel at their ingenuity and their wisdom, I am astonished at an anxietv which has neglected nothing, I see that an end was intended, and I find that end attained. What more does man ever do to attain his objects, when does he labour with more care and more knowledge, and when does he succeed with more certainty? Does woman show more anxiety, more contrivance, for her offspring, than the Parent of this little flower has displayed? And who can that careful, that affectionate parent be? No one! Even so was it no one that reared me from helplessness to maturity, I knew no parent's thought, no mother's care: there is no God. Can such a conclusion ever have entered the heart of man? We know not how to believe him who has declared it.

[*Abridged from* MACCULLOCH'S *Proofs and Illustrations of the Attributes of God.*]

THE CAMERA LUCIDA.

THE Camera Lucida, an invention of Dr. Wollaston, like the Camera Obscura, is an instrument employed in making copies of drawings, and in portraying distant objects; but it is of greater service than the Camera Obscura, being much more portable, and, if properly used, reflecting the image of the object without the least distortion.

If a piece of thin glass is held at an angle of forty-five degrees with the horizon, at a small distance from the table, and a sheet of white paper is placed immediately beneath it, the reflected image of an object before it will be visible, by looking downwards upon it; and as the glass is transparent, the hand and pencil can also be seen, and an outline of the image can be made upon the paper. In this case the image is inverted. Such an instrument as this can be made off-hand very easily. Let B be a piece of thin plate-glass, about an inch and a quarter long, and three-quarters of an inch wide; A a piece of wood in which the glass is fixed, and C a piece of pasteboard with a small hole in it, forming an eye-piece to keep the eye directed to one point. Let this little instrument be fixed on the top of a small stand, and you have a Camera Lucida of the simplest construction, but possessing the disadvantage of reflecting an inverted image.

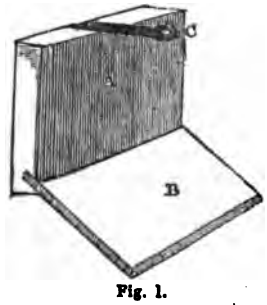


Fig. 1.

But the inversion can be corrected by taking a little more pains. Let A be a piece of looking-glass fixed in a wooden or brass frame, and connected with a piece of clear glass, B, so that the angle C B A shall be an angle of one hundred and thirty-five degrees, the image of an object placed at F will be reflected from the looking-glass at A, and proceed to the clear glass at B: from this it will be reflected upwards to the eye at G, and the glass being transparent, the image and the hand will be seen at the same time; in this case the image is erect. But, in general, neither of these plans are resorted to, for in both cases, as there are two reflecting surfaces from the glass, there will necessarily be two reflected images, one of them certainly much less vivid than the other, but still sufficiently visible to distract the eye

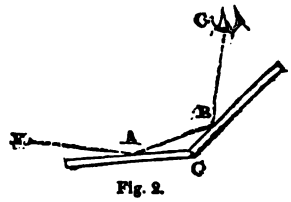


Fig. 2.

The optical portion of the Camera Lucida which is usually sold consists of a prism. Fig. 3 is a section of the prism employed; the angle A is equal to 22½ degrees, C to 135 degrees, D 22½ degrees, and B is a right angle of 90 degrees. The solid nature of the prism will not allow the hand to be seen through its thickness, and the instrument is used in a different manner to the last contrivance. A is the prism, B a moveable piece of brass, having a small eye-hole in it at B; the reflected ray from C is received near to this corner of the prism, and reflected upwards to the eye; the eye-hole is so adjusted that one-half only is over the prism, the other half leaves a free space through which the hand and pencil can be seen. In using the instrument a vast deal depends on the proper adjustment of this eye-hole.

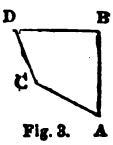


Fig. 3.

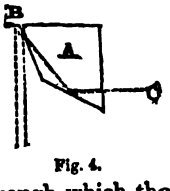


Fig. 4.

If the light is very powerful on the object, and much less so on the paper, the part of the prism exposed through the hole should be small, and the opening through which the paper is seen large in proportion. On the other hand, if the light on the drawing is weak, a larger part of the prism must be uncovered. In copying a print, great care must be taken that the print itself is perfectly flat and perpendicular to the horizon, and that the side of the prism at B A, fig. 3, which is opposite the print, shall be parallel to it. If this is not attended to, the print will be thrown into perspective and the copy be distorted.

If the object is to be copied of its natural size, its distance from the prism in front must be equal to the distance from the eye to the paper; if it is to be reduced it must be placed at a greater distance; if to be enlarged, it must be brought nearer.

The Camera Lucida has been fixed to the eye-hole of a telescope or a microscope, in such a manner as to allow the objects within the field of vision to be copied on paper.

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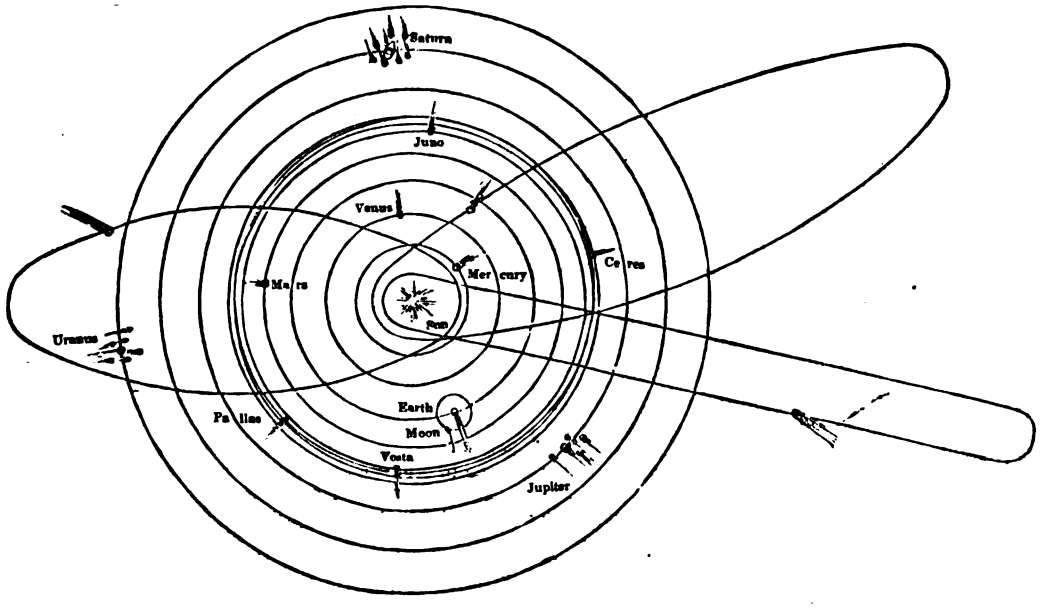
POPULAR ASTRONOMY. PART I.



THE SOLAR SYSTEM.

INTRODUCTION.

"WHEN I consider thy heavens, the work of thy fingers; the moon and the stars, which thou hast ordained;—what is man, that thou art mindful of him? and the son of man, that thou visitest him?"—Psalm viii., 3, 4.

When the inspired Psalmist gave utterance to these words, he was evidently under the influence of those feelings of awe, wonder, and admiration, which are sure to be excited in every intelligent mind, by the splendid and sublime phenomena presented to us by the heavenly bodies. When we consider the magnitude and the number of those bodies, the immense distances which separate them one from another, the almost inconceivable velocity with which they move, and that those which we can see form, probably, but a very small part of the whole number;—when we revolve these things in our minds, we are naturally brought to reflect on our own insignificance in the grand scheme of creation. If a man, after having applied to himself the vain and self-satisfying appellation of "lord of the creation," were to remember that the glorious sun, and the planets which revolve around it, form but one particular division, class, or system in the universe,—that the earth is but an humble member of that system, and that he, man himself, is but a moving particle on the surface of this earth,—he may well be expected to give utterance to the sentiments of David, and to wonder how the Great Deity can regard with parental care so humble a member of so magnificent a whole.

But this feeling, as Addison has beautifully shown, arises from the narrow powers of our own minds. We know that our perceptive faculties soon reach a boundary beyond which we cannot pass: we study the laws of Optics, but we know not the nature of Light:—we feel that we live and think, but we know not what constitutes life and thought. When, therefore, we judge of the Great Creator, by our own standard, we are lost in wonder at the vastness and at the minuteness, as also at the countless number of the objects which are under the Divine protection. But when we consider God as an Omnipresent and Omniscient Being, we then admit, indeed, that nothing is too vast, nothing too minute, nothing too numerous, for his notice; that He who could create and arrange the whole, can also watch over and preserve the minutest parts of that whole. Our notions of great and small are derived from our own imperfect experience, and strikingly show the limited scope of our minds. The distance of the sun from the earth is a quantity so immense, as almost to perplex the mind which reflects on it; and yet that distance is small, compared with the distance of the fixed stars:—again, the minuteness of the nerves and smaller blood-vessels of the human body, is such as to require the microscope to aid us in an examination of their structure, and yet there are other entire animals, endowed with life and powers of motion, which are so minute that the eye cannot perceive them. The words *great* and *small*, then, are for man's use; to the Almighty nothing is great, nothing is small; the revolving planet, and the animalcule whose world is a drop of water, being equally objects of his ever-active care. This divinely-sustaining power of Him, in whom "we live, and move, and have our being," is so obvious, that we may exclaim with the poet Thomson—

> Were every falt'ring tongue of man,
> Almighty Father! silent in thy praise,
> Thy Works themselves would raise a general voice,
> E'en in the depth of solitary woods
> By human foot untrod;—proclaim thy power,
> And to the choir celestial Thee resound,
> Th' eternal cause, support, and end, of all!

Nothing is more calculated to elevate the mind, and to display to us the wonders of Creation, than the study of Astronomy. We propose, therefore, to place before our readers a popular view of the elements, which serve for the basis of the astronomer's study. In doing this, we need not have recourse to the mathematical reasonings on which the various statements of the astronomer are founded; but we shall confine ourselves to such a simple explanation of the Mechanism of the Heavens as may pave the way for the study of a more systematic treatise. We trust, therefore, that both those who have, and those who have not, an opportunity of referring to more elaborate works, will not find the following pages devoid of instruction.

GENERAL APPEARANCE OF THE HEAVENS.

Let us suppose a man to be totally ignorant of Astronomy, and to turn his attention from events occurring upon earth, to those which are presented by the heavens. He sees a brilliant and glowing body, the Sun, rise in the east, at from four to eight o'clock in the morning, (according to the season of the year.) This body gradually attains a considerable altitude in the heavens, and continues to rise until noon;—it then gradually descends, and in its descent, bends towards the west, where it sinks, (apparently below the earth,) some time between four and eight o'clock in the afternoon. The spectator now loses sight of the glorious orb, which does not again become visible for several hours; and when it does again appear, it is not at the point where it escaped from view, but at the opposite side of the heavens, namely, at the point where it first appeared on the preceding day. On watching the progress of the sun, he finds that the path, before noticed, is again travelled over by the luminary, which becomes lost to his view, as before, in the west. A third and a fourth day the same phenomenon occurs; and the question naturally suggests itself to the observer's mind, "Is it the same cheering and dazzling visiter which I see day after day, or are they different bodies, resembling one another, and following one after another?" Were he to confine his attention to the occurrences of only a few days, he would, perhaps, think the latter supposition to be correct, viz., that they were different bodies which thus appeared to him day after day. But if he were to continue his observations for weeks, months, years, or the greater part of his life, and to find that the daily appearance of such a body still continued, he could hardly fail to conclude that it was the same body which thus so frequently attracted his attention and admiration. "But how?" (he might say,) "do I not see this ruddy disc of light dip into the ground in the west, and appear to me again in the east on the following morning: what becomes of it in the meanwhile?" To answer this question, or to obtain the means of answering it, he would, perhaps, trace more particularly the path which the sun followed from morning to evening, which he would find to be a semicircle, or a curve not differing much from it. If, likewise, he were to take note of the time occupied in these occurrences, he would soon find the time that the sun is above the surface of the earth to be, on an average, equal to the time that it is invisible.

From these two facts, it would be by no means unreasonable to arrive at the conclusion, that the sun moves in a circle; and that, while he is invisible to us, he is passing round the earth, in a direction from west to east, at which latter point he arrives at the moment that the observer sees him rise in the morning.

Here a difficulty arises, which it may well be supposed, would perplex the uninitiated observer. What can be meant by going round the earth, if the earth be, as it seems to our eyes, a flat and extended surface of ground, or water, which seems to touch the sky at the farthest points which the eye can reach:—how then can the sun pass round this? There can scarcely be a more reasonable question, so long as we judge merely by what meets the eye; but, if we extend our observations to certain appearances on the ocean, we begin to see proof that the surface of the water is not quite flat. On land, we have not the means of making a similar observation, because of the intervention of mountains and valleys. The proof that the surface of water is not quite flat, is derived from the following circumstance. If we are at sea, on a clear day, and watch the approach of a vessel from a distance, we find that the masts are visible sooner than the hull: we first see the top of the masts: then the whole height of the masts gradually comes into view; and finally, we see the hull. These different appearances of the ship, as it approaches towards the observer, are represented in the following figure. This could not occur if the earth were perfectly flat, because then the hull and masts would come into view at the same time.

It matters not what part of the world be chosen as the place of experiment; the result is almost exactly the same every where, and the amount of the bending of the surface of the ocean may be illustrated thus:—If we had a piece of string four miles long, and were to apply both ends to the surface of still water, and could possibly draw the string into a perfectly straight line, the middle of the string would be about sixteen inches below the surface of the water; thus showing that the water is not quite flat.

Thus might be supposed to arise the first conjecture that the earth is round, like a ball; a fact which was clearly proved by Captain Cook, who was the first to perform a voyage completely round the earth, about the year 1769. He left a given spot, and arrived again at that spot by an opposite course. There is an abundance of proof, derived from other sources, that the earth is a globe; but those will open upon us more plainly, as we advance.

We have hitherto endeavoured to trace what would probably be the feelings and opinions of one who, without previous instruction in Astronomy, should note the appearances presented by the sun. But that golden orb is not seen to be a solitary inhabitant of the sky: another luminous body about as large in apparent size as the sun, would soon attract the notice of the gazer. He would see it rise in the east, soar aloft, and then sink in the west. After the lapse of a few hours it would again appear in the east, attain a height from which

> .....With a boundless tide
> Of silver radiance, trembling round the world,

it would again descend, to sink as before in the west. The train of reasoning which would lead the observer to conclude that the sun revolved round the earth, would lead him to a similar conclusion regarding the moon. But here the resemblance terminates. The sun always presents a perfect circle to the eye of the observer day after day, and month after month; but a few evenings suffice to show that such is not the case with the moon: at one time a crescent only is seen, whose hollow side is towards the left of the observer; at another time the hollow side is towards the right: the crescent sometimes enlarges to a perfect circle; and at others it contracts from a circle to a crescent. If, then, the moon be a ball or globular body, shedding light upon the earth, there is great difficulty in conceiving what can occasion the change in its apparent shape; but, if we were to consider the moon to be an opaque or non-luminous body, we should find the means of explaining the change in its apparent figure, by supposing that the sun shines upon the moon, and that it is only by the reflection of the sun's light from the moon that the moon becomes visible to us. If we place a large round ball on a table, in a place where the sun is shining, we shall see the ball more or less illuminated, according to our position with regard to the ball and the sun: in one position, the ball will appear to be equally divided by a boundary line, into two semicircles, one illuminated and the other in the shade: in another position, the illuminated portion will be only a crescent, all the rest being shaded: from another point again it will all appear illuminated, except a small crescent of shade. If the observer watch the relative positions of the sun and moon, he will see that the shape of the bright part of the moon depends on its relative position in respect of the sun; just as the bright portion of the illuminated ball depended on the position in which he viewed it.

We should in this way find the means of accounting for the change in the shape of the moon. We shall, by and bye, show that these suppositions are really true. But another point would attract the notice of the observer, independently of the change in apparent form. If the two brilliant bodies, the sun and moon, were observed to be near each other on a certain day when the latter appeared as a thin crescent to the left of the sun, they would be seen the next day further removed, and on the following day, at a still greater distance from each other: if, therefore, the motion of the moon round the earth be admitted, it is necessary to suppose that motion to be slower than the sun's motion round the earth.

But in addition to the glowing light of the sun and moon, a glittering assemblage of smaller bodies meets the eye of the observer: a crowd of little spangles adorns the sky when the sun has left it, and softens the dreary darkness which results from his absence. These stars are seen to resemble the sun and moon in the circumstance of rising in or near the east, attaining a certain altitude, and setting in the west; from which circumstance the observer infers

that the stars, like the sun and moon, revolve round the earth. But, by a careful attention to different stars, he would find that the same remark does not apply to all. Those which rise exactly in the east, set exactly in the west; those which rise to the south of east, set south of west; and many which rise somewhat north of east, set somewhat north of west; but in looking northward he sees stars which appear neither to rise nor to set, but which perform a complete circle round a particular point of the heavens. For example,—there are seven stars, which, to most persons who pay any attention to the appearance of the heavens, are known under the name of the Great Bear. These stars never rise or set to an inhabitant of London. If they become invisible, it is either because clouds obscure them, or the superior brilliancy of the sun drowns their comparatively feeble light. The same may be said of five conspicuous stars known by the name of Cassiopeia's Chair.

If we watch the progress of these stars, and others in their vicinity, we shall find that they describe a circle round a star called the Pole-star. The position of this star we shall find to be nearly this: if we suppose the distance from the north point of our horizon (which is the line in which the surface of the earth appears to touch the sky) to the zenith (which is the point immediately over our heads) to be divided into five equal parts, then at about the height of three of those parts from the earth, will be seen the Pole-star.

All this would seem to show to an observer, that the Pole-star is the end of an axis round which all the stars revolve, and that the reason why we cannot see the whole circular path of any stars except of those in the vicinity of the Pole-star, is, that they pass round under the earth during a part of their journey, and are therefore concealed from our view. Those stars which are further removed from the Pole-star describe a larger circle than those which are nearer, while the Pole-star is almost stationary. This is exactly what takes place when we see a wheel turn round; the axle remains in one spot, but any particular point on the outer edge of the wheel describes a larger circle than that which is described by any point between the axle and the circumference.

If we consider the Pole-star to form one end of the axle or axis round which the stars revolve, then it is obvious that there must be an opposite end of the same axis, in the contrary direction. If then we turn towards the south, with the expectation of seeing such a point, we shall find that it will not be realized; for none of the stars in that quarter are seen to describe circles; for they all rise and set. Still, however, the semicircles or portions of semicircles, commonly called arcs, which they describe, appear to have a common centre, which is some distance below the horizon; and this centre may be considered as the southern end of the axis before spoken of.

If we suppose the observer to have arrived at this amount of information respecting the stars, he will be prepared to notice the uniformity of the positions of the stars with respect to one another. The Great Bear, for instance, whether it be under or over the Pole-star, or at the right or the left of it, will always have its seven principal stars at the same relative distances from each other. The changes which take place in the distance of the sun from the moon, would lead to the opinion that these revolve round the earth in unequal times; and by similar reasoning, the constant maintenance of the same distance between any two stars, would seem to imply that the stars revolve in equal times.

The seeming myriads of stars which present themselves to the notice of the observer all appear to follow this rule, of remaining at the same relative distances from one another, with very few exceptions. These exceptions, are, indeed, so few, that a constant watching of the same part of the heavens for a considerable period, would be necessary to determine that a star had actually changed its place relatively to other stars. There have, however, been discovered at different times ten stars, more or less brilliant, which change their relative distances from one another, and from other stars. These we know by the name of Planets; and by a careful attention to their movements, it is seen that each one travels in a curved path among the other stars, and returns again nearly to the point from whence it set out.

At intervals, again, star-like bodies of another order present themselves, whose progress among the other stars is more rapid than that of the planets; and which at a period more or less brief, vanish altogether from the view of the observer, and do not return till after a long absence. To such bodies we give the name of Comets.

Such then are the equally sublime and facinating appearances which present themselves to the eye of an observer, when that eye is directed towards the heavens. That the invigorating and fructifying warmth and light shed by the sun,—the serene, quiet light of the moon,—and the diamond-like glittering of the stars,—should invite men to a study of the laws which, under their Divine Creator, govern the motions of such exquisite globes of light, is what we are not only prepared to expect, but fancy that we should feel disappointment in finding it otherwise. Man is not, by nature, the cold heartless being who can let such beauties pass unheeded; and if he approach the study with the humility which true self-knowledge is calculated to engender, he becomes more and more able to appreciate the surpassing grandeur and power of the great Being who made and who rules all. Well, indeed, may we direct our attention to the phenomena which we have briefly described, and to which Milton so exquisitely alludes in the following lines:—

> First in his East the glorious lamp was seen,
> Regent of day, and all th' horizon round
> Invested with bright rays, jocund to run
> His longitude through Heaven's high road; the gray
> Dawn, and the Pleiades * before him danced,
> Shedding sweet influence: less bright the moon,
> But opposite in levell'd West was set
> His mirror, with full face borrowing her light
> From him; for other light she needed none
> In that aspect, and still that distance keeps
> Till night; then in the East her turn she shines,
> Revolved on Heaven's great axle, and her reign
> With thousand lesser lights dividual holds,
> With thousand thousand stars, that then appear'd
> Spangling the hemisphere: then first adorn'd
> With their bright luminaries that set and rose,
> Glad evening and glad morn crown'd the fourth day.
>
> *Par. Lost*, b. vii.

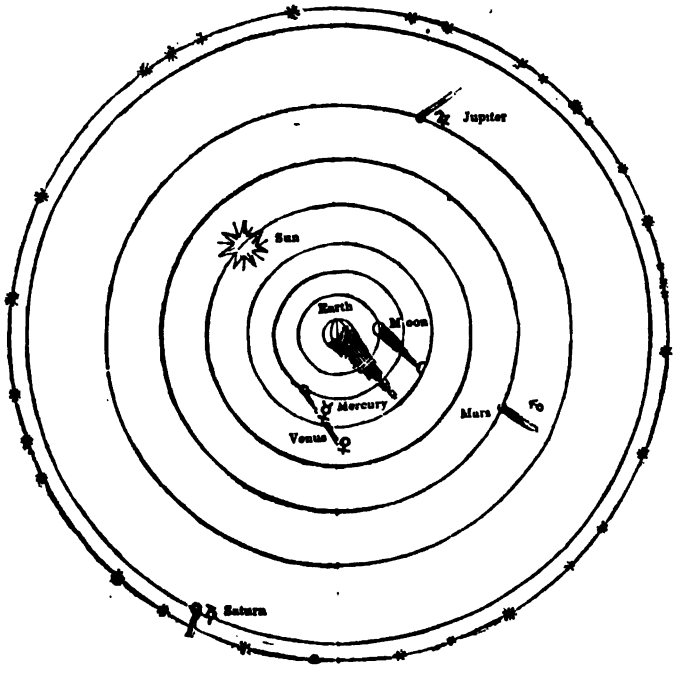
THEORIES TO EXPLAIN THE MOTIONS OF THE HEAVENLY BODIES.

In very early ages, before Europe occupied a page in the history of nations, the phenomena of the heavens were studied with great attention by several nations of the East. The Chaldeans, the Indians, the Chinese, and the Egyptians, have all left evidences of the industry and ingenuity with which their observations were conducted. They constructed observatories,—invented instruments for observing and measuring with accuracy,—separated the stars into different groups, called Constellations, for the facility of finding any particular star,—gave particular names to most of the moving stars or planets, and noted the period which each took to move through its apparent path in the heavens; and, in many other ways, the ancients helped to lay the foundation of that mass of astronomical knowledge which the men of later ages have brought to more maturity.

Various opinions were formed respecting the motions of the sun, moon, and stars of all kinds, both with reference to one another, and also to the earth; but the first theory which had attained a name and an importance in the early ages of the world, was that of Ptolemy, a distinguished Egyptian astronomer, who lived about one hundred and thirty years after the birth of Christ. He conceived that the various bodies which had been distinguished by the appellation of "the heavenly host," were disposed in the order represented in the annexed diagram.

He supposed, according to the popular opinion, that the Earth was fixed as the centre of the universe, and that the Sun, Moon, Planets, and Stars, revolved round it in the following order; namely—the Moon, Mercury, Venus, Sun, Mars, Jupiter, and Saturn; the Moon being the nearest, and so on; exterior to all of which, he supposed that a great concave sphere in which all the stars were fixed, kept on revolving round the earth. From the early history of Astronomy, we learn that before the time of Ptolemy, it had been conjectured by some, that the earth passed round the sun, and not the sun round the earth; but the difficulty of believing a statement so contrary to appearances and to the evidence of one's physical senses, led to the rejection of this opinion; and although it was afterwards found to be

* Seven small stars clustered together in the constellation Taurus. These stars rise with the sun about the time of Spring, and our poet, in this passage, intimates the old and common opinion that the Creation took place in the Spring.



THE PTOLEMAIC SYSTEM.

correct, yet nearly two thousand years elapsed before such a theory was generally admitted by philosophers.

After Ptolemy had promulgated the theory which bears his name, he found that there were certain difficulties which followed from the adoption of it. He conceived that the seven bodies mentioned before which revolved round the earth, moved in the same general direction from West to East. But on watching the progress of some of the planets, he found that they did not appear to travel uniformly round the earth, but seemed to have, at certain times, a retrograde or opposite motion, with reference to the other planets; while at other times they seemed to be stationary. To account for this, he was obliged to suppose that those planets did not revolve in a perfect circle round the earth, but that they described a peculiar path called an epicycloid, of the nature of which some idea may be formed from the following illustration:—if we had a large coach wheel, and by any contrivance could make a smaller wheel roll round the outside of it, at its circumference, then, any particular point on the small wheel would describe that curve which is called an epicycloid: the axle of the small wheel would describe a perfect circle, but it is easy to see that any point on the edge would not describe a circle. Ptolemy was obliged to multiply these epicycloids to a most perplexing extent, in order to account for the various appearances of the planets. It is to this circumstance that Milton alluded, when he spoke of the shifts and difficulties which beset the progress of those who build their opinions on a wrong foundation:—

> When they come to model Heaven
> And calculate the stars, how they will wield
> The mighty frame; how build, unbuild, contrive,
> To save appearances; how gird the sphere
> With centric and eccentric scribbled o'er,
> Cycle and epicycle, orb in orb.——*Par. Lost*, b. viii.

There is nothing which more beautifully shows the power and force of truth, than the embarrassments which retard the progress of those who do not take truth for their guide. In religion, in morals, in science, he whose steps are guided by the light of truth, can arrive, by a short and pleasant path, at results which others can scarcely obtain by a complex and wearying track. Thus Ptolemy was forced to assume the existence of much unwieldly machinery in the scheme of the heavens, in order to account for those motions which are most simple and beautiful; this was because he placed (in his own imagination,) the earth in the midst of the heavenly bodies, all of which were made to revolve round it.

Great as were the difficulties which attended the adoption of the Ptolemaic system, it yet retained its ground, with some slight modifications, until the time of Nicholas Copernicus, an eminent astronomer, who was born at Thorn, in Polish Prussia, in 1473. This distinguished individual perceived the unreasonable results which follow from the theory of Ptolemy. That all the planets, the sun, the moon, and all the stars and comets, should revolve round the earth, seemed to him much more unnatural and complex than that the earth should revolve on its own axis, and move in an orbit round the sun. All the appearances of the heavenly bodies can be explained with much greater ease and simplicity by the latter supposition than by the former; and Copernicus was thus led, after the study of forty years, to the adoption of a theory which had been advocated by Pythagoras and Thales of Greece, five or six hundred years before the time of Ptolemy.

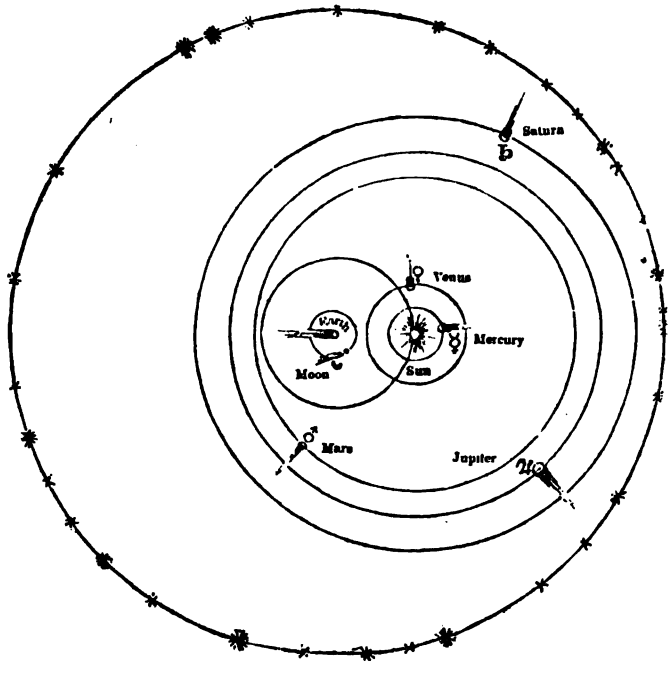
The frontispiece to this number is a representation of the solar system, according to the theory of Copernicus. In this system, the sun, the glorious source of light and heat to us, is placed in the centre. Round him the planets revolve in the following order:—Mercury, Venus, Earth, Mars, Jupiter, and Saturn. Since the time of Copernicus, five more planets have been discovered, namely, Uranus, Pallas, Vesta, Juno, and Ceres. In order to account for the phenomena presented by the moon, Copernicus assumed, (what has since been confirmed,) that the moon has a two-fold motion,—round the earth and round the sun: a small circle, therefore, surrounds the earth, which circle represents the path of the moon round the earth, while the earth and the accompanying moon together revolve round the sun. The frontispiece of course represents the Copernican system with the addition of the five planets since discovered. The circles represent the orbits of the several planets; that is, the paths in which they travel in their progress round the sun. The distances of these circles from the centre at which the sun is placed, could not conveniently be in the same proportion one to another, as the real distance of the planets is respectively from the sun, because the innermost orbits would be too small to be conveniently seen. The real proportions, however, which exist between the distances of the planets from the sun, admit of being easily understood. For instance, the earth, (as we shall hereafter explain more fully) is about ninety-five millions of miles from the sun. If now we call that distance 1, the distances of the other ten planets from the sun, will be represented by the following numbers, with sufficient nearness for our present purpose.

Mercury	⅜	Ceres, Pallas	2¾
Venus	¾	Jupiter	5¼
Earth	1	Saturn	9½
Mars	1½	Uranus	19½
Vesta, Juno	2¼		

There was an astronomer of very great skill, who lived about the same time as Copernicus, who thought that a mean might be struck between the theories of Ptolemy and Copernicus, by which the favourite idea of a celestial revolution round the earth might still be retained, and so concession might be made both to the growing authority of science, and to the persuasion of men's senses. This astronomer was Tycho Brahé, who was born in 1546, at Knudstrup, in Denmark. The system advocated by him, and which is named from the inventor the Tychonic system, is represented in the annexed diagram.

In this system, which was published about the year 1586, the Sun is considered as a centre, round which five of the planets revolve; namely, Mercury, Venus, Mars, Jupiter and Saturn; while at the same time, the Sun himself, with all those planets, revolves round the Earth. It certainly appears strange that a man of such eminent abilities as Tycho was, should have preferred this ponderous arrangement to the more simple theory advocated by Copernicus. After the death of Tycho, his theory gradually sank in the estimation of philosophers, who found, in the arrangement advocated by Copernicus, the means of explaining celestial phenomena by less complex reasonings than by the theories either of Ptolemy or of Tycho Brahé.

Here, then, we arrive at an important part of our subject; that there are, as we shall hereafter show more clearly, immense bodies revolving in orbits which measure millions of miles across. The appearances presented to the eye



THE TYCHONIC SYSTEM.

lead to an opinion that these bodies revolve round the earth; but a further inquiry into the accompanying circumstances, have led men universally, at the present day, to conclude that the earth and the other planets revolve round the sun.

What then can keep these splendid bodies in motion? How did they first begin to move? And why do they revolve round the sun instead of moving in a straight line? These questions naturally occur to our minds, for our humble faculties can give us but a faint idea of the powers necessary to keep such immense masses in motion. If we see a carriage passing with great rapidity along a railway, we can account for its motion, by tracing the action of steam-pressure upon a piston; which, by connecting machinery, makes the axles of the wheels revolve, and thus sets the whole vehicle in motion. If we see a carriage passing along the street, we can assign a cause for its motion, by the muscular efforts of the horse which is attached to it. If a ball be shot from a cannon, its flight is so rapid as to render it invisible to us, but we can account for its motion by considering that a quantity of gunpowder, small in bulk, suddenly enlarges to about two thousand times its former dimensions, by being converted into gas, when heat is applied; and that the endeavour to obtain two thousand times as much room as it before occupied, acts with such pressure against the ball as to force it out with fearful velocity. All this we can understand, because we can trace the progress of the occurrences step by step. But when we turn to the heavens, we are lost in wonder! Our means of judging admit of no such details of comparison as those which before assisted us; and we are brought to the conclusion that the Almighty, for his own wise purposes, impressed upon the heavenly bodies those motions which we know they possess,—which we can calculate and measure,—but the origin of which we can here never know.

But ought this circumstance to prevent us from studying the nature and extent of the motions impressed upon these glorious bodies? Is it presumptuous in us to endeavour to become acquainted with the laws which, once known, will give us additional proofs of the wisdom and power of the Divine architect of the heavens? Assuredly not! The origin of those movements we know not, but the study of the nature and direction of them is a noble and fitting employment for the human mind.

In the century following the age of Copernicus and Tycho Brahé, there sprang up a genius, who was destined to add more to the amount of human knowledge in this path than any one, perhaps, who had previously existed. This was Sir Isaac Newton, who was born in 1642, at Woolsthorpe, in Lincolnshire. This distinguished man displayed from boyhood an ardent love for the study of the natural phenomena around him. When a child, he made clepsydras, or clocks which told the hour by the descent of water through an orifice at the bottom of a vessel. He also constructed a windmill, which was worked, in part, by a mouse placed inside. As he grew towards manhood, his soaring mind directed itself to the sublime phenomena presented by the heavens, and to the nature and composition of light. That part of his career which more particularly concerns us at present, we will now consider.

When Newton was about twenty-three years of age, he was forced to leave Cambridge where he had been residing, on account of the appearance of the plague at that town. He retired to Woolsthorpe, where, sitting one day in his garden, he saw an apple fall from a tree at his feet. The falling of an apple might have been noticed often enough; but Newton's searching mind directed itself to this inquiry: "Why does the apple fall, when it is loosened from the tree?" Some may laugh at such a question,—some have laughed at it,—and yet the only answer which the laughers

could give, would be, "Because it is the nature of things to fall, when unsupported." This vague explanation did not satisfy the sagacious Newton. He set himself to consider the nature of the occurrence which had attracted his notice, and of others similar to it, and he finished by framing that train of opinions which, under the name of the Theory of Gravitation, laid the foundation of all correct knowledge of the motions of the heavenly bodies, and which is now received by all who deserve the name of philosophers.

> All intellectual eye, our solar round
> First gazing through, he by the blended power
> Of gravitation and projection saw
> The whole in silent harmony revolve.——THOMSON.

We shall here find it convenient to consider the nature of this force of gravitation, and will endeavour to do so in the simplest way possible. Every particle of matter in the creation has a tendency to attract, or draw towards itself, every other particle, however distant it may be. We know not what this attraction is; we can therefore only judge of it by its effects. This attraction is of different degrees of force according to the size or density of the attracting body. A small loadstone or magnet will take up a little key, whereas a larger magnet will take up a larger key: so it is with attraction; a lump of lead weighing one pound only, attracts a distant body with half the force which is exerted by another piece of lead weighing two pounds. Again, the force of this invisible agency is subject to variation with respect to the distance between the attracting and attracted bodies. If a mass of lead be the attracting body, and two equal-sized bodies be at some distance from it, the one which is the nearer of the two will be attracted with greater force than that which is further removed. The diminution of attractive power from increase of distance is much more rapid than from the lessening of the size of the attracting body. For instance, if any mass of matter attract another mass with such force as to make it move through twenty feet in a second of time; then, if the first mass be removed to double its former distance, the strength of the attraction will be so much weakened, that the second body will move only five feet in a second, or with one-fourth of its former rapidity.

These simple principles, when applied to such immense bodies as the planets, produce results of a gigantic kind. It may be asked, "If a pound of lead will attract a piece of cork more strongly at the distance of one than of two feet, how is it that we cannot see the proofs of such a fact in practice?" The reason is, that the earth itself forms such an enormous mass of matter that it completely neutralizes the effects of the comparatively small bodies at its surface. In strict truth, if an apple be suspended from the branch of a tree, it tends to attract the earth upwards to meet it; but the attraction of the earth for the apple is so incalculably more powerful, that the moment the apple is loosened from the tree, the earth draws it down to meet it, and that is what occurs when we say that the apple falls. Suppose that, instead of an apple, a mass of lead weighing a thousand pounds, were for a moment suspended in the air; the lead would tend to attract the earth upwards towards itself with much greater force than the apple had done; but still the earth's attraction would so completely overpower the lead, that it would be drawn down to the earth; while the latter would rise to meet it by a quantity, wholly inappreciable by mortal sense, though not by computation.

But let us now suppose a body placed in the universe, equal in size to the earth, but at some distance from it. Here we perceive that there is no reason why the earth should attract the other body more strongly than the latter attracts the earth; accordingly, if they were both free to move, they would naturally approach towards each other, each one moving through half the distance which separated them. If, therefore, we were to suppose that the universe contained many such bodies, each as large as the earth, each one would attract all the others, with a force varying only as the several distances varied. But if one body were very much larger than any of the others, it would attract each of the others more powerfully than itself could be attracted; and would not, therefore, have to move through so great a distance to meet any of the other bodies, as they would have to move through, in order to meet it.

All this admits of being impressed upon the mind with tolerable clearness, so long as we consider the bodies to be in the first instance stationary, and then receiving an impulse. But how can we explain the curved path which each of the heavenly bodies describes in its progress through space; and why do not *all* the planets get close together by virtue of the attraction which draws them one to another? These questions we cannot answer without a previous attention to other particulars, which we must shortly explain.

If we stand at the top of a high tower, and throw a stone forward to the ground, we shall find that the stone will not proceed on in a straight line, but that it will soon assume a bending path and approach towards the earth. The direction in which this bending occurs, is such as to bring the stone to the earth in a more perpendicular direction than it had when it set out. Now the reason why the stone is thus forced to change the direction in which it first began to move, is, because the earth attracts it and hastens its descent. If we suppose it possible that a hole could be bored through the earth from side to side, we should find the mass of matter would be more accumulated in the direction which passes through the centre of the earth than in any other direction; and as bodies attract other bodies in proportion to their mass of matter, we see reason to believe that a falling stone is attracted more powerfully towards the central direction of the earth, than towards any other part. When, therefore, the stone has left the hand, it gradually tends to a direction perpendicular to the surface of the earth, or it gets into a direction which, if continued, would lead to the centre of the earth.

Now if there were no such force as gravitation, the stone would proceed in the same straight line in which it was first propelled. If it were thrown upward from the surface of the earth, it would continue to travel upwards, without ever again descending to the earth. Here we should remember that there is in nature no such thing as *up* and *down*; but that *up* means simply a departure from the centre of the earth, *down* an approaching towards that centre.

We all know with what amazing velocity a cannon-ball moves, after it has left the mouth of the cannon; yet it soon begins to decline towards the earth, whether it be originally shot from the cannon in a horizontal or in an upward direction. But still the curvature of its path towards the earth is much less rapid than in the case of the stone, because the latter moved so much more slowly. The mortar in St. James's Park can propel a bomb to a distance of about four miles, before it will fall to the earth; whereas a stone thrown by a very powerful arm would certainly fall to the ground within a few hundred yards. Suppose, now, that it were possible to increase to an indefinite extent the velocity with which a cannon-ball would move; say that it should travel ten or twenty miles before it touched the ground; a greater velocity would carry it one hundred miles before it fell: and we may go on in the same train to any extent we please, always bearin mind that, the quicker the body moves, the greater distance will it travel before it falls to the ground. Now, if we assume such a velocity that the ball would travel twenty-five thousand miles before it fell to the earth, we shall arrive at a very curious result. The diameter of the earth is almost eight thousand miles, which gives, for the circumference, about twenty-five thousand miles. The ball would, therefore, have gone completely round the earth before it fell to the ground. If the velocity were still greater it would not reach the ground at the completion of this circuit, but would go on to describe part of another revolution round the earth. When this condition is once attained, the ball might, by a due increase of the projectile force, continue to revolve for ever about the earth, and we should thus have a cast-iron satellite moving around us.

Let not the reader smile at the absurdity of supposing a cannon-ball to travel twenty-five thousand miles; for it will lead us to important results. If we suppose that the sun were stationary in the universe, and that a body very much smaller than the sun were to be projected with immense velocity in a direction at right angles to a line joining the sun and the other body, then the latter (which would proceed in a straight line if the sun were not present) is drawn by the sun into a curved path, the concave or hollow side of which is always towards the sun. If the velocity with which this body were propelled were below a certain limit, it would move in a spiral which would gradually end at the sun himself, to which, therefore, the body would fall: if the velocity were beyond a certain limit, the body would describe a spiral round the sun, but gradually receding from it, and the body would continue through infinite ages to recede farther and farther from the sun: but if a certain velocity, of a corresponding ratio with the attractive power of the sun, were imparted to this body in the first instance,

it would move constantly round the sun, arriving at every revolution at the point from whence it started.

We are now in a condition to explain in some degree how we are to regard the motions of the planets round the sun. When the Almighty had created the various bodies which compose the universe, he exercised his infinite power and wisdom by imparting to them various velocities of motion. The sun being made very much larger than all the planets put together, exerted a more powerful attraction on them than they could exert on him; consequently, the planets were drawn towards the sun out of their original paths, and made to revolve round the larger body. But how shall we sufficiently admire the exquisite skill with which the various velocities were adapted to the size of the various bodies! What parallel can we find in the poor and imperfect works of man, to that surpassing power of adjustment by which the velocities of the planets are regulated! The earth moves some hundreds of thousands of miles in a single day; and yet, if her velocity were to deviate by a small fraction, either more or less, the earth would, in the first case, gradually recede from the sun, and never again approach near him; and in the second case, it would approach to, and fall upon, the sun. It is when such results as these are obtained, that science enables us to appreciate the striking truth, that man's efforts even in his proudest moments, are but poor and humble attempts to follow after, or to imitate, that which the Great Being performs with such boundless perfection. We applaud, and we give rewards to the man, who can make a chronometer which will be accurate within a few seconds in the year; and well may we do so, for it is a signal instance of human industry and ingenuity to produce such an instrument. Yet a mere fraction of such an error in the movements of the bodies composing the solar system, would be fatal to its stability. Truly wonderful, indeed, is it, that the eleven planets should revolve round the sun in periods differing greatly one from another, and at such various distances from him; and yet, that each one should have a velocity so exquisitely adjusted to its size and position as to bring it precisely round to the same point after every entire revolution round the sun. The sun, then, the golden magnet which thus draws all the other planets towards itself, is surrounded with whirling worlds, which borrow their light from him and share it with one another. Well might the poet of the seasons exclaim—

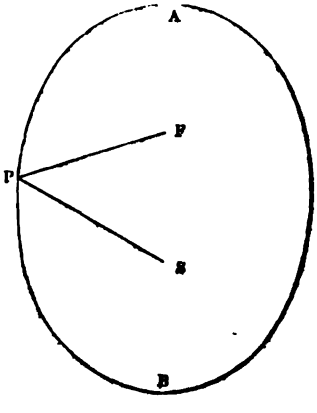
> ..... Thou, O sun!
> Soul of surrounding worlds! in whom best seen
> Shines out thy Maker! May I sing of thee?
> 'Tis by thy secret, strong attractive force,
> As with a chain indissoluble bound,
> Thy system rolls entire: from the far bourne
> Of utmost* Saturn, wheeling wide his round
> Of thirty years, to Mercury, whose disk
> Can scarce be caught by philosophic eye,
> Lost in the near effulgence of thy blaze.

FORM OF THE ORBITS OF THE PLANETS.

Our remarks hitherto have been so expressed as to lead to the conclusion that the planets move in perfect circles round the sun at all times, and under all circumstances. Such, however, is not strictly the case. The paths which they describe are oval or elliptical. Most persons know the form which is meant by the term oval. If we hold an egg in the hand, and look at its outline, it will give a near approach to this form: and, indeed, the word *oval* is derived from *ovum*, the Latin for *an egg*. Such, then, is the form of the paths in which the planets move. Now we may inquire whether the sun is exactly in the middle of this oval, or near either end of it. To this it must be answered that the sun is not precisely in the middle, but that he is a little nearer to one side than the other. It will be useful to give an idea of the position which the sun occupies. Suppose A B represent the orbit or path in which a planet (such as the earth) moves round the sun. (We have made this a larger oval in proportion than the earth's orbit really is, in order that our meaning may be more conspicuous.) There are two points F and S (called *foci*, plural of the Latin word *focus*, signifying *a fire-place*), which have peculiar properties. If we stick a pin in each of the points F and S, and fasten the two ends of a bit of thread to them, (taking care that the thread is just long enough to reach to any one part of the circumference, as at P,) we shall find that we shall be able to make the thread exactly touch every other part of the oval, by stretching it out; but that we cannot make it extend beyond the oval in any direction.

Now it is in one of such points F S that the sun is situated, in the earth's orbit. The oval, if we could possibly see it at once with the eye, would scarcely appear to us to deviate from a circle: it being rather a round, not a long oval. We here speak only of the earth's orbit, but the same remark applies to the orbits of all the planets, which orbits are all more or less oval. We use the term *oval* in preference to the term elliptical, because it is more familiarly known; the meaning of each is, however, the same.

We may now be asked, whether the planets move equably in every part of their orbits,—that is, If a planet move at the rate of so many miles in an hour at one part of its orbit, will it move with the same velocity at another part? This question, on account of the oval form of the paths in which the planets move, must be answered in the negative. They do not move equably in different points of their orbits. Suppose that in the following figure, the point S were like the axle of a wheel, and that twelve equidistant spokes, or radii, reached from it to the boundary of the oval, then the earth, in passing by the end of each spoke during her revolution, would not pass from one to another in exactly equal times, but would take a longer time to pass from spoke to spoke at one part of her revolution than at another. But now let us suppose, that the *time* which the earth takes to revolve round the sun be divided into twelve equal parts, and that we draw a spoke from the axle, or the point S, to the boundaries between all the twelve spaces respectively passed over by the earth in those equal times; then it will be found that the open space between any two adjoining spokes, measures exactly the same number of square miles at every part of the orbit. The spokes towards the end A will be closer together than those towards B, but they will at the same time be longer, so that the excess of length precisely compensates for the deficiency in width. Here is another instance of the admirable adjustment which is observable in the motions of the heavenly bodies. The orbits of the planets are all oval, and differing in the form of the oval; yet the law which we have just stated is found to be constant. The more the orbit approaches to what we may term a long oval, the greater is the difference between the lengths of the spokes towards the two ends. Yet in every case, a disagreement in length is made up by a reverse disagreement in the openings between them, so that these areas or openings are all equal. We have been anxious to avoid every appearance of scientific difficulty in these details; but we will just mention that those who may be able to consult larger works on Astronomy, will find this law thus expressed; that "a planet always describes equal areas in equal times."



Those fleeting and transient visiters, comets, are too seldom in sight to afford the means of making such correct observations of the nature of their orbits, as have been made with respect to the planets. We shall, by-and-by, have to speak individually of several comets, which have appeared at various times, but we now merely refer to their motion generally. It is now believed, from the best observations which have been made, that the comets move in exceedingly long oval orbits, by which means they are at one time very near to the sun, and at other times at an immense distance from him; still, however, the same general resemblance to the orbits of planets is to be noted, and, in addition, that the elongation of the form of the cometary orbit is frequently excessive.

We shall hereafter have to show, that the four largest of the planets have moons, or satellites, revolving round them, of which our moon, the earth's satellite, is the one which attracts a larger share of our attention than any of the others. Now it is interesting to observe, that the moon of itself describes an oval orbit round the earth, in a similar manner as the earth does round the sun. But here a singular effect results:—if the earth were stationary, the moon's orbit would be found, as in the case of the planets,

* Thomson had written this before the year 1730; and the planet Uranus was not discovered until 1781.

to be an oval with respect to the earth; as, however, the earth revolves round the sun, and, of course, carries the moon with it, the real path of the latter becomes a very singular and complicated curve,—it is a zig-zag circle round the sun, with several indentations and as many protuberances.

Thus then do we form some general idea of the manner in which the planets are situated, with respect to one another and to the sun. It will be useful to recapitulate a few points before we proceed further.

We have seen that there is a glorious luminary, the Sun, in the centre of a moving system; that there are eleven planets revolving round him in the following order, beginning from the nearest,—Mercury, Venus, Earth, Mars, Vesta, Juno, Ceres, Pallas, Jupiter, Saturn, and Uranus; that these planets describe paths which are not quite circular but oval, and that the sun is in one focus of the ellipse or oval. The motions of the planets we have likewise found are not uniform, but that their velocities vary according to their distances from the sun. These general details will qualify us to enter upon the consideration of all the planets individually, their dimensions, distances from the sun, velocities of motion, influence upon one another, apparent size as seen from the earth, and many other points of interest to the admirers of the works of God. When that inquiry shall have been completed, we shall enter upon the consideration of those very beautiful and important results, which depend upon the rotation of the planets on their axes,—a species of motion to which we have not hitherto alluded.

We cannot better conclude this portion of our subject than by presenting the reader with the eloquent words of a pious and eminent divine, in connexion with the sublime subject which has thus far occupied us.

"The world in which we live, is a round ball of a determined magnitude, and occupies its own place in the firmament. But when we explore the unlimited tracts of that space which is everywhere around us, we meet with other balls of equal or superior magnitude, and from which our earth would either be invisible, or appear as small as any of those twinkling stars which are seen on the canopy of heaven. Why then suppose that this little spot, little at least in the immensity which surrounds it, should be the exclusive abode of life and intelligence? What reason to think that those mightier globes which roll in other parts of creation, and which we have discovered to be worlds in magnitude, are not also worlds in use and in dignity? Why should we think that the great Architect of nature, supreme in wisdom, as He is in power, would call these stately mansions into existence and leave them unoccupied? When we cast our eye over the broad sea, and look at the country on the other side, we see nothing but the blue land stretching obscurely over the distant horizon. We are too far away to perceive the richness of its scenery, or to hear the sound of its population. Why not extend this principle to the still more distant parts of the universe? What though, from this remote point of observation, we can see nothing but the naked roundness of yon planetary orbs? Are we therefore to say, that they are so many vast and unpeopled solitudes; that desolation reigns in every part of the universe but ours; that the whole energy of the Divine attributes is expended on one insignificant corner of these mighty works; and that to this earth alone belongs the bloom of vegetation, or the blessedness of life, or the dignity of rational and immortal existence?

"But this is not all. We have something more than the mere magnitude of the planets to allege in favour of the idea that they are inhabited. We know that this earth turns round upon itself; and we observe that all those celestial bodies which are accessible to such an observation, have the same movement. We know that the earth performs a yearly revolution round the sun; and we can detect, in all the planets which compose our system, a revolution of the same kind, and under the same circumstances. They have the same succession of day and night. They have the same agreeable vicissitude of the seasons. To them light and darkness succeed each other; and the gaiety of Summer is followed by the dreariness of Winter. To each of them the heavens present as varied and magnificent a spectacle; and this earth, the encompassing of which would require the labour of years from one of its puny inhabitants, is but one of the lesser lights which sparkle in their firmament. To them, as well as to us, has God divided the light from the darkness, and he has called the light day, and the darkness he has called night. He has said, let there be lights in the firmament of their heaven, to divide the day from the night; and let them be for signs, and for seasons, and for days, and for years; and let them be for lights in the firmament of heaven, to give light upon their earth; and it was so. And God has also made to them great lights. To all of them he has given the sun to rule the day; and to many of them has he given moons to rule the night. To them he has made the stars also. And God has set them in the firmament of heaven, to give light upon their earth, and to rule over the day, and over the night, and to divide the light from the darkness; and God has seen that it was good.

"In all these greater arrangements of Divine wisdom, we can see that God has done the same things for the accommodation of the planets that he has done for the earth which we inhabit. And shall we say, that the resemblance stops here because we are not in a situation to observe it? Shall we say, that this scene of magnificence has been called into being merely for the amusement of a few astronomers? Shall we measure the counsels of heaven by the narrow impotence of the human faculties? or conceive, that silence and solitude reign throughout the mighty empire of nature; that the greater part of creation is an empty parade; and that not a worshipper of the Divinity is to be found through the wide extent of yon vast and immeasurable regions?

"It lends a delightful confirmation to the argument, when, from the growing perfection of our instruments, we can discover a new point of resemblance between our Earth and the other bodies of the planetary system. It is now ascertained, not merely that all of them have their day and night, and that all of them have their vicissitudes of seasons, and that some of them have their moons to rule their night and alleviate the darkness of it; we can see of one that its surface rises into inequalities, that it swells into mountains and stretches into valleys; of another, that it is surrounded by an atmosphere which may support the respiration of animals; of a third, that clouds are formed and suspended over it, which may minister to it all the bloom and luxuriance of vegetation; and of a fourth, that a white colour spreads over its northern regions, as its Winter advances, and that, on the approach of Summer, this whiteness is dissipated, giving room to suppose, that the element of water abounds in it, that it rises by evaporation into its atmosphere, that it freezes upon the application of cold, that it is precipitated in the form of snow, that it covers the ground with a fleecy mantle, which melts away from the heat of a more vertical sun; and that other worlds bear a resemblance to our own, in the same yearly round of beneficent and interesting changes.

"Who shall assign a limit to the discoveries of future ages? Who can prescribe to science her boundaries, or restrain the active and insatiable curiosity of man within the circle of his present acquirements? We may guess with plausibility what we cannot anticipate with confidence. The day may yet be coming, when our instruments of observation shall be inconceivably more powerful. They may ascertain still more decisive points of resemblance. They may resolve the same question by the evidence of sense, which is now so abundantly convincing by the evidence of analogy. They may lay open to us the unquestionable vestiges of art, and industry, and intelligence. We may see Summer throwing its green mantle over these mighty tracts, and we may see them left naked and colourless after the flush of vegetation has disappeared. In the progress of years or of centuries, we may trace the hand of cultivation spreading a new aspect over some portion of a planetary surface. Perhaps some large city, the metropolis of a mighty empire, may expand into a visible spot by the powers of some future telescope. Perhaps the glass of some observer, in a distant age, may enable him to construct the map of another world, and to lay down the surface of it in all its minute and topical varieties. But there is no end of conjecture; and to the men of other times we leave the full assurance of what we can assert with the highest probability, that yon planetary orbs are so many worlds, that they teem with life, and that the mighty Being who presides in high authority over this scene of grandeur and astonishment, has there planted the worshippers of His glory."—CHALMERS, *Astronomical Discourses.*

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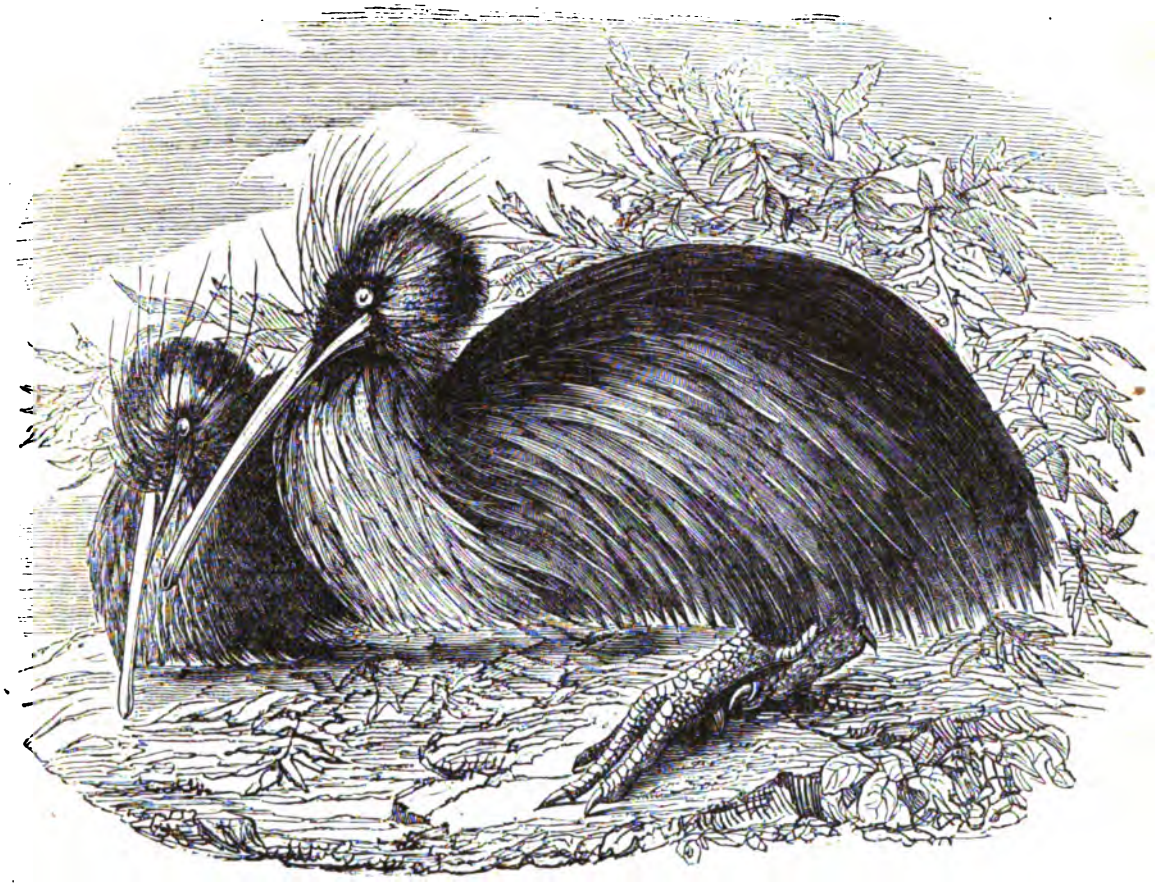
A REMARKABLE BIRD FROM NEW ZEALAND.



THE APTERYX, (*Apteryx Australis.*)

THE figure we have given above of this singular bird, has been copied, by permission of the author, from the last part of Mr. Gould's splendid work on the birds of Australia. The scientific world were indebted, in the first instance, for their knowledge of the Apteryx, to the late Dr. Shaw, by whom it was figured and described in the *Naturalist's Miscellany*. This specimen was presented to the doctor by Captain Barclay, of the ship Providence, who brought it from New Zealand in the year 1812. At the death of Dr. Shaw, this, at that time unique, example passed into the possession of the present Earl of Derby. In consequence of no public collection containing a specimen, the naturalists of the Continent were slow in believing in its very existence. M. Temminck considered that, like the dodo, it was an extinct species; while others, among them M. Lesson, believed it was altogether fabulous, and that its description was founded on the remains of the dodo preserved in the British Museum.

Within these few years, the existence of the Apteryx has been well established; its native place is New Zealand, where it is known by the name of *kiwikiwi*. It is hunted at night by the natives, who employ lights to deceive the birds, and dogs to destroy them, the feathers, which are extremely soft, being in high estimation in the manufacture of cloaks of ceremony; "a mat ornamented with them is the most costly dress a chief can wear." So highly prized is a garment of this description, that a European, who had resided in New Zealand for six years, had an opportunity of seeing but one cloak made of these feathers, and no consideration could induce the owner to part with it. Several specimens of the skins of this singular bird have been lately presented to the Zoological Society of London by the New Zealand Association, and its peculiar characters have been better ascertained, although as yet little is known of its habits. It has been stated, that the natives decoy the Apteryx from its lurking place by breaking the dead branch of a tree, the sudden snapping sound produced causing it to start from its concealment.

The peculiar structure of the Apteryx, the length of its bill, the strength of its feet, and the almost entire absence of wings, caused it to be a difficult task to assign it to its proper place in the system. The bill of the Apteryx, being long and slender, at

first sight bears a great resemblance to that of the curlew, but on closer examination a great distinction is observable; the nostrils in the bill of the last bird are always placed at the base, and this is necessary on account of the mode of seeking its food, consisting of worms and other small animals which are found imbedded in mud, into which the bird plunges its bill. If the nostrils were at the tip, they would be filled with earth, and the creature be at least incommoded. The Apteryx, on the other hand, obtains its food from the surface, and, therefore, the placing the nostrils at the extremity is a useful arrangement, by which the organs of smell are brought nearer to the object in view; and this is more necessary on account of its being a nocturnal bird, the darkness causing the eyes to be of little service.

The bird itself is about the size of a three months' old turkey, and of a dark brown colour; the flesh is black, sinewy, tough, and tasteless. Mr. Gould gives his opinion on the subject in the following words:—

A mature consideration of the form and structure of this remarkable bird, lead me to assign it with little hesitation to the family of the *Struthionidæ*, (birds allied to the ostrich) and my reasons for so doing, will, I think, be obvious to every one who will examine and compare the species with the members of that group. The essential characters in which it differs, consist in the elongated form of the bill, the shortness of the tarsi, and in the possession of a sharp spur, terminating a posterior, rudimentary toe. Regarding the ostrich as the species to which it is least nearly related, we find in the emu and the rhea a much nearer approach, not only in the more lengthened form of the bill of the latter, but also in the situation of the nostrils, which, in the rhea, are placed nearer the tip than in any other species of the group, the Apteryx excepted; in fact, when we compare the bills of the two birds, it is evident they are both formed on one plan, that of the Apteryx being an elongated representative of the rhea, with the nostrils placed at the extreme tip.

In both these birds there is the same peculiar elevated horny core or fold. The tarsi are much shorter, and the nails of the toes much more curved than in the rhea, but the scaly covering of these parts, in both birds, is precisely the same; and it may be further observed, that the number of toes increase as we pass on from the ostrich, there being only two in that bird, three in the rhea, emu, &c., and three, with the rudiment of a fourth, in the Apteryx. The wing of the Apteryx, though scarcely more than rudimentary, agrees with that of the rhea in having a strongly-hooked claw at its extremity, while in the structure of its feathers it approaches the nearest to the cassowary, but unlike what attains in that bird, the feathers are entirely destitute of the accessory plume, in which latter respect it again agrees with the rhea.

The members of this group, although few in number, are remarkable for their structural peculiarities, each being modified for its own peculiar habits and economy, and in none is this circumstance more remarkable than in the Apteryx, which, at the same time that it departs the farthest in form from the type of the group (the ostrich,) also departs the farthest in its mode of life and general economy; being, in fact, adapted to the peculiarities of its own country, and fitted for the particular kind of food there to be obtained.

Although the Apteryx approaches nearer to the rhea than any other known bird, I am inclined to think that several intervening links will yet be discovered between them; indeed, a native of New Zealand who was present at one of the late meetings of the Zoological Society, stated that there is another Apteryx in New Zealand, with a shorter and thicker bill, but which he considered to be the male of the present species. Without doubting that he has spoken to the best of his knowledge, I suspect that it will prove to be distinct, and that the two birds in my plate are representatives of both sexes.

The favourite localities of this bird are low marshy situations, and those covered with extensive and dense beds of fern, among which it conceals itself; and when hard pressed by dogs, the usual method of chasing it, it takes refuge in crevices of rocks, hollow trees, and the deep holes which it excavates in the ground in the form of a chamber; in these latter situations it is said to construct its nest of dried fern and grasses.

While undisturbed, (says Mr. Short, in a letter to Mr. Yarrell,) the head is carried far back in the shoulders, with the bill pointed to the ground; but when pursued, says the native of New Zealand, it runs with great swiftness, carrying the head elevated like the ostrich.

When attacked it defends itself very vigorously, striking rapid and dangerous blows with its powerful feet and sharp spurs, with which it is also said to beat the ground in order to disturb the worms on which it feeds, seizing them with its bill the instant they make their appearance; it also, probably, feeds upon snails and insects. Very recently a perfect specimen of this bird, preserved in spirits, has been received by the Zoological Society of London, and we may shortly expect a full and accurate account of its anatomical structure.

SCRIPTURE PICTURES.

THE absurdities of Chinese paintings have been familiar to us from our earliest days, and we have often laughed at the grotesque effects which their ignorance of the art of perspective produces, at their houses apparently hanging in mid-air, and trees growing out of their windows, streams running upwards instead of downwards, and steeples which seem to rival Baron Munchhaussen's.

The art of painting has elsewhere been brought to perfection, yet (in one class of pictures at least) absurdities, less glaring indeed, but not less real, are to be found, in artists too whose names have attained a deservedly high place in the ranks of fame.

In Scripture paintings we shall see representations as untrue to recorded facts as Chinese pictures can be with respect to natural objects; and as objects of sight make a greater impression on us than what we read, the false ideas conveyed in this way have, as might have been expected, taken pretty deep root.

The liberties in which painters have indulged themselves in their representations of the great enemy of man, are most gross, and we might say ridiculous, were it not for the fatal consequences which have attended these absurd representations, and were it not that they have been instrumental in making the doctrine of Satanic influence a matter of scoffing and jest instead of a powerful motive to watchfulness and fear. The Christian painters have pillaged the profane poets for a personification of Satan, and we see on canvass, not the fallen archangel, dreadful in his moral influence over the souls of men, powerless now over their bodies, but the heathen fiction Pan. This latter, with goats' horns, distorted countenance, cloven feet, and long tail, was well suited for the character he was intended to represent for producing panic fears, rustic merriment, and frolic mischief, to those in whose sports and interests he was fabled to take an especial concern. Nor, perhaps, could imagination produce a more grotesque representation, and better adapted for suggesting and keeping alive the associations which led mankind to fable the divinity of Pan, and make him preside over rural affairs and sports. But is there the slightest community between this mixture of frolic, fun, and benevolent care, and that fearful being whom inspired authority represents as a roaring lion, going about seeking whom he may devour; whom the same authority exhorts us to resist steadfastly, and from whose wily attacks even our Lord himself, in his human character, was not exempt? An imperfect knowledge of the manners and customs which prevailed at the time of the

JOHN W. PARKER, Printer, 45, St. Martin's Lane, London.

Scripture narrative, has given rise to another class of errors in our Scripture paintings; as an illustration of this, one will readily occur. Those who are acquainted with ancient history, know that it was the custom among the eastern nations, and among the Romans, to recline at meals, instead of sitting as we do. In the pictures of the Last Supper, however, our Lord and his Apostles are represented as sitting round the table; and yet the words of the Evangelist evidently imply a reclining posture; "Now there was leaning on Jesus' bosom one of his disciples whom Jesus loved:" this is intelligible only under the supposition that they were in a recumbent posture, and that consequently the head of one person approached the shoulder of the person that was above him.

There are other mistakes in Scripture representations which appear to arise from an inattention to the Scripture narrative. The Evangelists, and before them the prophets, all describe the Immanuel as having nothing to distinguish Him in outward garb and appearance; "He hath no form nor comeliness," says Isaiah: the people looking upon Him, asked, "Is not this the carpenter's son?" and the very complaint against Him was, that He gave no sign by which they might know Him. Yet in defiance of all this, almost all painters have represented our Lord with that distinguishing mark of a glory round His head, which, had it really existed, would have been a sign unto the people. This mistake may appear unimportant, since not even a child probably can really imagine that this is a true representation. Still the fact is thus far kept out of sight, that there was nothing *external* by which Jesus could be recognised; that they were to judge Him by His works, and that when He did appear under a form that could show His divine original, (as at the transfiguration,) it was only to a chosen few; to Peter, and James, and John, and as a reward, doubtless, for their having believed on Him without a sign.

To an inattention to the Scripture narrative, another very common mistake in Scripture pictures may be traced. It has often been observed how little of our Lord's early history is unfolded to us. But it is remarkable that almost the only fact that is recorded respecting it, and which is given, doubtless, with a view to our imitation and for the sake of the example, is so altered by painters as to be useless to us in this respect. We are told in the Sacred Writings that Jesus at twelve years old went up to Jerusalem after the custom of the feast, and that He was found "in the temple sitting in the midst of the doctors, both hearing them and asking them questions," setting an example (that is) to children, of the humility and desire for instruction which peculiarly becomes their age. Many painters, on the contrary, represent Christ as sitting and teaching, not hearing, in an attitude and place which plainly indicates that He was giving, not receiving, instruction, and the whole force of His example in this respect, as a practical lesson to young people, is consequently lost.

In the representations of our Lord's baptism, there is another very common error committed by painters, which is the more worthy of notice, because it both tends to degrade the subject, and also to keep out of sight what throws light on other passages of Scripture. To illustrate these words of Scripture: "And Jesus, when He was baptized, went up straightway out of the water; and lo, the heavens were opened unto Him, and He saw the Spirit of God descending like a dove and lighting upon Him;" a dove is represented as hovering over Jesus. Many commentators of great merit have understood these words, "descending like a dove," to mean, that the appearance which indicated the descent of the Holy Spirit, had a hovering motion like a dove*; that this appearance was, in fact, a flame of fire which hovered around and descended on Christ, as a bird hovers and lights upon any object. In confirmation of this opinion it has been observed by the Rev. Dr. Hinds, (see his *Three Temples of the one true God,*) that fire, a light from heaven, appears to have been the established sign of God's presence; it was in fire that God appeared to Moses in Midian; it was the Sheckinah which signified Jehovah's abode in the tabernacle; by a pillar of fire God conducted His people through the wilderness, and at the delivery of the law the Most High appeared amidst lightning on Mount Sinai. In later times, at the dedication of the temple at Jerusalem, it was miraculously filled with a glory and a mysterious light; and after our Lord's ascension, it is recorded that, on the day of Pentecost, when the Holy Ghost descended on the apostles, that "there appeared unto them cloven tongues like as of fire, and it sat upon each of them." To represent, then, a bird as descending upon our Lord, seems quite inconsistent with every other account of the appearance of the Divine Spirit which is recorded, and seems an unworthy symbol of Him who, under the more awful imagery of "a consuming fire," is so often mentioned by the inspired writers.

There are many other instances of misrepresentations in Scripture paintings which might be noticed, and which, when once the attention is called to the subject, will be easily detected.

* The words in the original imply that it was a hovering motion, like a dove.

APRIL DAY.

All day the low-hung clouds have dropt
Their garnered fulness down;
All day that soft, gray mist hath wrapt
Hill, valley, grove, and town.

There has not been a sound to-day
To break the calm of nature;
Nor motion, I might almost say,
Of life, or living creature;—

Of waving bough, or warbling bird,
Or cattle faintly lowing;—
I could have half believed I heard
The leaves and blossoms growing.

I stood to hear,—I love it well,—
The rain's continuous sound;
Small drops, but thick and fast they fell,
Down straight into the ground.

For leafy thickness is not yet
Earth's naked breast to screen,
Though every dripping branch is set
With shoots of tender green.

Sure since I looked at early morn,
Those honeysuckle buds
Have swelled to double growth; that thorn
Hath put forth larger studs.

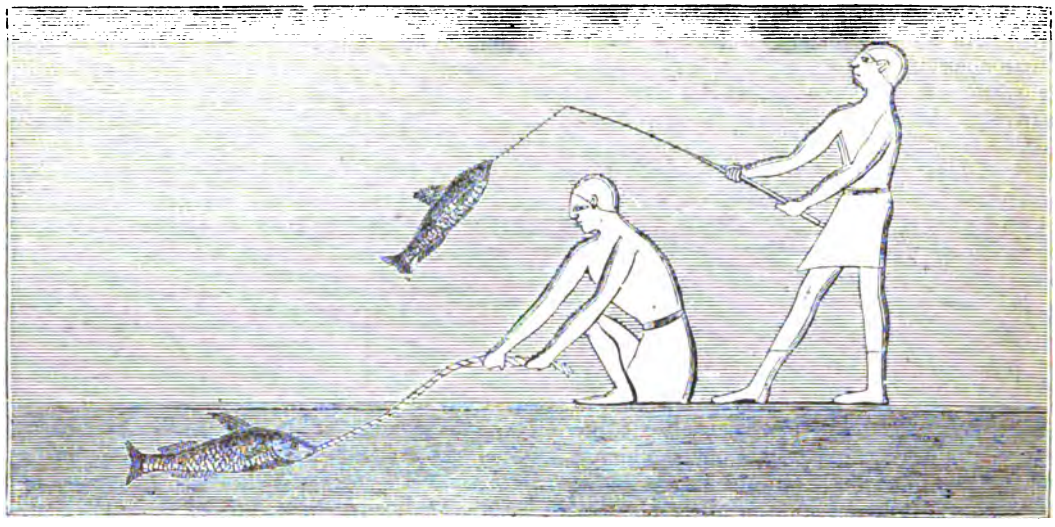
That lilac's cleaving cones have burst,
The milk-white flowers revealing;
Even now, upon my senses first
Methinks their sweets are stealing.

The very earth, the streamy air,
Is all with fragrance rife!
And grace and beauty everywhere
Are flushing into life.

Down, down they come—those fruitful stores,
Those earth-rejoicing drops!
A momentary deluge pours,
Then thins, decreases, stops.

And here the dimples on the stream
Have circled out of sight;
Lo! from the west, a parting gleam
Breaks forth of amber light.

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY. No. XI.



FISHING BY THE LINE.

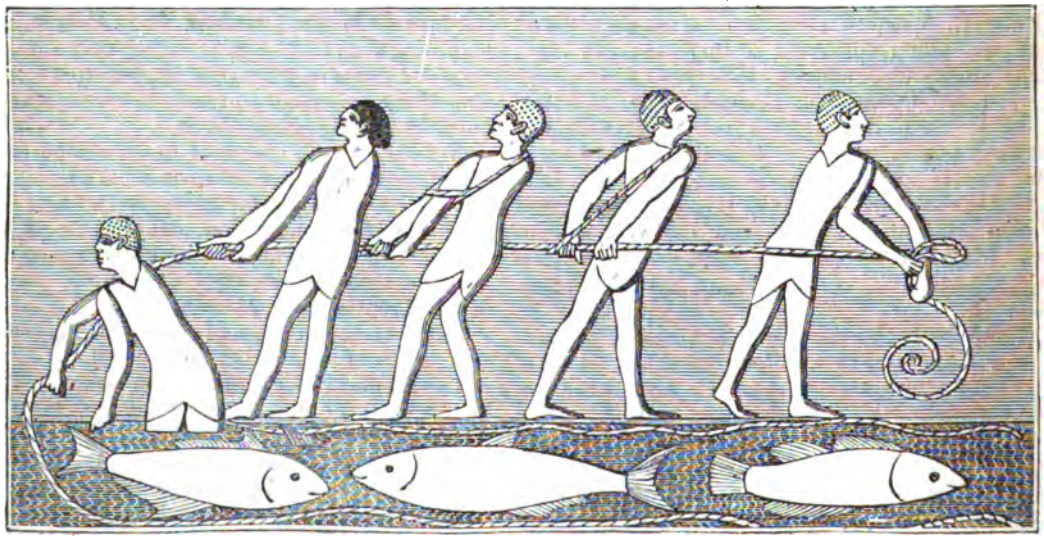
THE PLAGUES OF EGYPT, 2.

IN the Scripture account of the first plague, it is mentioned that "the fish that was in the river died:" this was a fearful aggravation of the plague, for fish was a favourite article of food in Egypt, and few employments are more frequently depicted on the monuments than those connected with catching and curing the fish of the river.

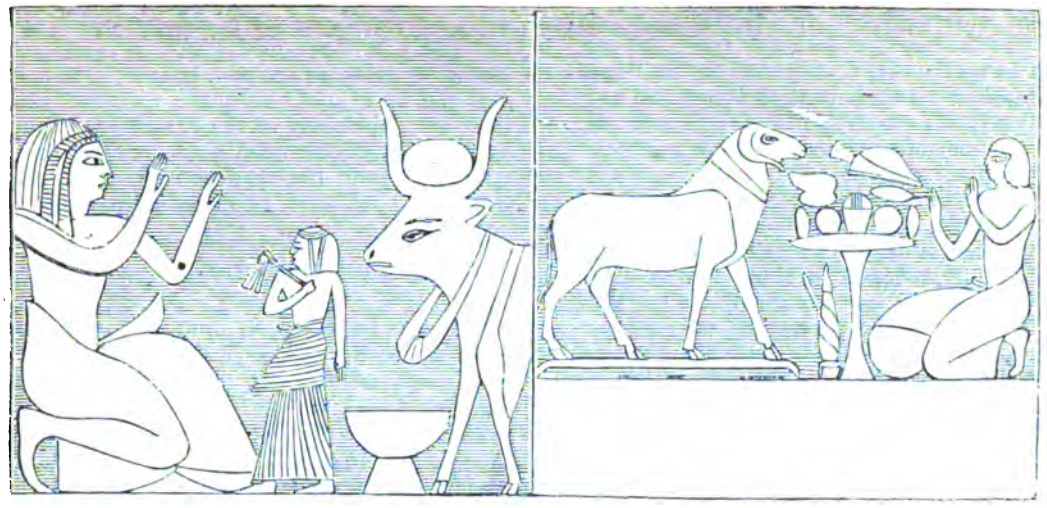
We are informed that the ancient Egyptians had a religious scruple against using any of the produce of the sea; hence the fisheries of the Nile were peculiarly valuable. The Egyptians indeed were the first people who practised the art of curing and preserving fish: they both dried them in the sun and salted them. For the latter purpose fossil salt was largely imported from the African deserts. It must also be observed that the destruction of the fish was a punishment operating directly on Pharaoh himself, for the principal fisheries belonged to the crown; and we are informed by Diodorus Siculus that a portion of the revenue derived from them was assigned to the queens as pin-money. There were several varieties of fish, so as to gratify every palate; and hence, when the Israelites began to murmur against Moses in the wilderness, one of their chief complaints was, "We remember the fish that we did eat in Egypt freely."

Some writers have rashly asserted that fresh-water fish do not abound in Egypt, but their error has arisen from their having visited the country when the waters of the Nile were at the lowest. As, however, advantage has been taken of their authority to impugn the Scripture narrative, we shall extract from M. Michaud an account of the present state of the fisheries on the lake Menzaleh.

The waters of Menzaleh are very productive: the Arabs assert that it contains as many kinds of fish as there are days in the year. Whatever may be the number of species, they multiply with amazing rapidity. The fisheries of Menzaleh have been always farmed out by the government of Egypt: they formed an important item in the revenues of the Circassian sultans and the Mamelukes, and at present they yield eight hundred purses annually to Mohammed Ali, which is rather more than 8000*l*. The lake contains several clusters of islets, but those called the Matharian are alone inhabited. Their population, however, is so numerous that there is scarce room on the ground to plant a shrub, and huts are mixed confusedly with tombs. The entire population is engaged in catching or curing fish: the best fishing grounds are portioned into divisions by reeds and rushes, forming as it were the farms of the fishermen, and these private properties are far more respected than the fields of the unhappy *fellahs*. The inhabitants of the Matharian islets have all the jealousies of insular people: woe betide the strange fisherman who would venture his boat into their petty archipelago or who would be caught let-



FISHING WITH THE NET.



ANIMAL WORSHIP AND SACRIFICES OF THE EGYPTIANS.

ting down his nets near their islands. We went into the village of *Kafi-al-Nossarah*, situated at the western extremity of the lake: near the village is a kind of harbour for the fishing boats: some of these have sails, others are impelled by oars or a long pole. The village is built of mud and reeds; the inhabitants are huddled together in wretched huts; the children are naked. The men wear coarse caps, fitting tight to the head, and either loose drawers or a cincture like the Scottish kilt. Their physiognomy has something of a sorrowful and savage cast. There are about seventeen villages round the lake Menzaleh, the sole employment of whose inhabitants is fishing: it is also their only resource. With the salt fish which they send to Cairo, Syria, and the interior of Africa, they purchase dates, rice, coarse cloth, wood to build their boats, hemp for their lines and nets, and fire-arms for fowling or defence. Not less barbarous than the Bedouin Arabs, they have only a vague notion of the Koran; they scarcely can count the days of the year, and the only means they have of determining the hour of the day is by the projection of their shadows.

From the prophet Isaiah we learn that the Egyptian fisheries were in his day reckoned among the most valuable possessions of the nation, and that they knew the art of catching fish, not only with the line but the net. This is fully confirmed by the monuments, on which we find both modes of fishing delineated. Isaiah's severe denunciation of divine wrath includes little more than a portion of the first plague, actually inflicted by Moses.—"And they shall turn the rivers far away, and the brooks of defence shall be emptied and dried up: the reeds and flags shall wither. The paper reeds by the brooks, by the mouth of the brooks, and everything sown by the brooks, shall wither, be driven away, and be no more. The fishers also shall mourn, and all they that cast angle into the brooks shall lament, and they that spread nets upon the waters shall languish. . . . . And they shall be broken in the purposes thereof, all that make sluices and ponds for fish." (Isaiah xix. 6—10.)

The circumstances we have mentioned are fully sufficient to show how severe was this first plague, and they also prove that the Scripture narrative is supported by all that we know of the natural condition of Egypt, and all that we can learn from its historic records.

It is said further by the sacred historians, "the magicians of Egypt did so with their enchantments:" to this two objections have been made; first, that there are no means by which jugglers could imitate such a miracle, and secondly, that all the waters were already changed. Now it seems pretty clear that in the second objection we can find an answer to the first. The magicians could easily procure fresh water by digging, and an illusion similar to the change effected by the miracle is possible with small quantities of water. Among the tricks mentioned by the Emperor Jehangueir in his account of the performances of the Indian jugglers, to which we have already referred, there are several performed with vessels of water: one of them deserves to be quoted.

They filled a large vessel with water perfectly transparent, and placed it on the floor before me. One of them had in his hand a red rose, which he said, by giving it a dip into the water, he could bring it out of any colour I chose to mention. Accordingly he gave the rose a plunge, and out it came of a bright yellow; and thus at every dip he brought it out of a different kind and colour. They then plunged a skein of white thread into the vessel, and brought it out first of a red then of a yellow colour, and so of a different colour a hundred times repeated, if they were required so to do.

The distinction between the miracle and its spurious imitation is sufficiently explained in the Scripture narrative: Moses smote the river; the magicians practised their art only on some limited quantity of water, and in such a case deception was not only practicable but easy.

The second plague of frogs is remarkable, because the beloved river the Nile is again made the instrument of punishment, and because it was imitated by the magicians. The third plague of lice, (or, as the word *kinnim* may perhaps be translated, musquitoes,) was beyond the power of the jugglers, for they at once acknowledged the supernatural character of the miracles wrought by Moses and Aaron, exclaiming, "This is the finger of God!" Such an exclamation fully proves that their former attempts to rival Moses and Aaron were juggling delusions. The Jewish and Arabian traditions concur in asserting that some of the magicians were on this occasion converted to the worship of the true God, and were in consequence persecuted by the Egyptian tyrant.

After the fourth plague of flies an important incident is recorded, which throws considerable light on the preceding part of the narrative. "And Pharaoh called for Moses and Aaron, and said, Go ye, sacrifice to your God in the land. And Moses said, It is not meet so to do; for we shall sacrifice the abomination of the Egyptians to the Lord our God: lo, shall we sacrifice the abomination of the Egyptians before their eyes, and will they not stone us?"

The proposal of Pharaoh is one which could never have been made by a native Egyptian, for it is clear from what follows that the Hebrews were notoriously about to sacrifice some of the animals deemed sacred by the Egyptians. The cow, reverenced as the emblem of Isis, and the ram, which typified Ammon, were held objects of religious worship among the Egyptians, and we find their votaries on the monu-

ments actually engaged in this degrading adoration. A foreign conqueror like Pharaoh might despise, or at least be reckless of, the national superstition; but a native prince would have never sanctioned so gross a violation of his country's most inveterate usages.

The accuracy of the sacred historian in this important passage will be still more apparent, if we enter upon a brief examination of the Zoolatry, or animal worship, of Egypt. Some were divinely honoured because they were feared, others on account of their utility. Those most reverenced were the single bull Apis, the cow, the sheep, the cat, the dog, the wolf, the crocodile, the ibis, the ichneumon, and the hawk. Lands were set apart for the support of those sacred animals whilst they were living; men and women were employed in feeding and maintaining them, and children succeeded their parents in the office, which was so far from being declined, or thought despicable by the Egyptians, that they considered it the most honourable of all employments, and wore certain cognizances as signs of their office, which were always saluted with great respect by their countrymen. If a person killed any of these sacred animals designedly, he was punished with death; if involutarily, his punishment was referred to the priests; but if a man killed either a cat, a hawk, or an ibis, whether by design or not, he was to die without mercy, and the enraged multitude seldom waited even for the formalities of trial. While Diodorus Siculus, the celebrated historian, was in Egypt, he witnessed an example of this sanguinary bigotry. A Roman, in the train of an embassy sent to conclude a peace with the king, happened accidentally to kill a cat; a mob instantly gathered round the house, and neither the remonstrances of the royal officers, nor fear of the Roman power, could mitigate their ferocity, or save the unfortunate man's life. On this account, if any one by chance found one of these sacred animals dead, he stood at a convenient distance from it, and with great lamentations protested that he was innocent of the death. And what may seem still more incredible, it is reported that, in time of famine, which drove the inhabitants to the cruel necessity of devouring one another, there was no person accused of having tasted of any of these sacred animals. When any one of these animals died, they lamented them as if they had been their dearest children, and frequently expended vast sums on their funeral. We are told that, in the beginning of the reign of Ptolemy, the son of Lagus, the bull Apis, dying of old age at Memphis, his keeper expended more than fifty talents of silver, or 13,000*l.* on his costly interment.

On the history of the remaining plagues it is unnecessary to dwell, for they are evidently of such a nature as to be scarcely susceptible of illustration from monuments. The murrain of the beasts, and the plague of boils and blains, were followed by two particularly alarming to the Egyptians; the storm of thunder, lightning, and hail must have been exceedingly formidable in a land where these atmospheric phenomena are scarcely known; the plague of locusts is to this day dreaded as one of the most grievous visitations to which eastern nations are exposed, and the plague of "darkness which could be felt," was well calculated to strike terror into a nation, which made the sun-god the chief object of its idolatry, and in whose country a fog, or even a dense mist, is never produced by nature. The smiting of the first-born, was the fearful consummation of these Divine judgments; Pharaoh and his subjects hasted to send the Israelites away, and they quitted the land of Egypt. We have seen that, from the first visit of Abraham down to the departure of Moses, every particular mentioned by the sacred historian is minutely confirmed by monuments now brought to light after a concealment of more than two thousand years, and that the authenticity of the Pentateuch is supported by contemporary records; for monuments are records removed beyond the chances of error in transcription, or the possibility of modern corruption.

ON THE USES OF KNOWLEDGE.

THE first end to which all wisdom or knowledge ought to be employed, is to illustrate the wisdom or goodness of the Father of Nature. Every science that is cultivated by men leads naturally to religious thought, from the study of the plant that grows beneath our feet, to that of the host of heaven above us, who perform their stated revolutions in majestic silence, amid the expanse of infinity. When in the youth of Moses, "the Lord appeared to him in Horeb," a voice was heard, saying, "draw nigh hither, and put off thy shoes from off thy feet; for the place where thou standest is holy ground." It is with such a reverential awe that every great or elevated mind will approach to the study of nature, and with such feelings of adoration and gratitude, that he will receive the illumination that gradually opens upon his soul.

It is not the lifeless mass of matter he will then feel that he is examining,—it is the mighty machine of eternal wisdom; the workmanship of Him, "in whom every thing lives, and moves, and has its being." Under an aspect of this kind, it is impossible to pursue knowledge without mingling with it the most elevated sentiments of devotion;—it is impossible to perceive the laws of nature without perceiving, at the same time, the presence and the providence of the Lawgiver:—and thus it is that, in every age, the evidences of religion have advanced with the progress of true philosophy; and that science, in erecting a monument to herself, has, at the same time, erected an altar to the Deity.

The knowledge of nature is not exhausted. There are many great discoveries yet awaiting the labours of science, and with them there are also awaiting to humanity, many additional proofs of the wisdom and benevolence "of Him that made us." To the hope of these great discoveries few indeed can pretend; yet let it ever be remembered, that he who can trace any one new fact, or can exemplify any one new instance of divine wisdom or benevolence in the system of nature, has not lived in vain; that he has added to the sum of human knowledge, and, what is far more, that he has added to the evidence of those greater truths upon which the happiness of time and eternity depends.

The second great end to which all knowledge ought to be employed, is to the welfare of humanity. Every science is the foundation of some art beneficial to men; and while the study of it leads us to see the beneficence of the laws of nature, it calls upon us also to follow the great end of the Father of Nature in their employment and application. I need not say what a field is thus opened to the benevolence of knowledge;—I need not tell you that, in every department of learning, there is good to be done to mankind;—I need not remind you, that the age in which we live has given us the noblest examples of this kind, and that science now finds its highest glory in improving the condition, or in allaying the miseries of humanity. But there is one thing, of which it is ever proper to remind you, because the modesty of knowledge often leads us to forget it,—and that is,

that the power of scientific benevolence is far greater than that of all others, to the welfare of society.

The benevolence of the great or the opulent, however eminent it may be, perishes with themselves; but the benevolence of knowledge is of a kind as extensive as the race of man, and as permanent as the existence of society. He, in whatever situation he may be, who, in the study of science, has discovered a new means of alleviating pain, or of remedying disease; who has described a wiser method of preventing poverty, or of shielding misfortune; who has suggested additional means of increasing or improving the beneficent productions of nature, has left a memorial of himself which can never be forgotten, which will communicate happiness to ages yet unborn, and which, in the emphatic language of scripture, renders him a "fellow-worker" with God himself, in the improvement of his creation.

The third great end of all knowledge is the improvement and exaltation of our own minds. It was the voice of the Apostle, "What manner of men ought ye to be, to whom the truths of the Gospel have come?" It is the voice of nature also, "What manner of men ought ye to be, to whom the treasures of wisdom are opened?" Of all the spectacles, indeed, which life can offer us, there is none more painful or unnatural, than that of the union of vice with knowledge. It counteracts the great designs of God in the distribution of wisdom, and it assimilates men not to the usual characters of human frailty, but to those dark and malignant spirits who fell from heaven, and who excel in knowledge only that they may employ it in malevolence.

To the wise and virtuous man, on the contrary, —to him whose moral attainments have kept pace with his intellectual, and who has employed the great talent with which he is intrusted to the glory of God, and to the good of humanity,—are presented the sublimest prospects that mortality can know. "In my Father's house," says our Saviour, "are many mansions;" mansions, we may dare to interpret, fitted to the different powers that life has acquired, and to the uses to which they have been applied.

Of that great scene, indeed, which awaits all, whether ignorant or wise, it becomes us to think with reverential awe. Yet we know, "that it will then be well with the good, though it will not be well with the wicked;" and we are led by an instinctive anticipation, to suppose that they who here have excelled in wisdom and benevolence, will be rewarded with higher objects, upon which they may be employed, and admitted into nearer prospects of the government of eternal wisdom. "In his light they shall see light." "They shall see him, not as through a glass darkly; but as he is. They shall know, even as they themselves are known."—ALISON.

CRICKETS.

(*Gryllus campestris,*) or FIELD-CRICKET.

THERE is a steep abrupt pasture-field, interspersed with furze, close to the back of this village (Selborne), well known by the name of the *Short Lithe*, consisting of a rocky dry soil, and inclining to the afternoon sun. This spot abounds with the *Gryllus campestris*, or Field-Cricket, which, though frequent in these parts, is by no means a common insect in many other counties.

As their cheerful summer cry cannot but draw the attention of a naturalist, I have often gone down to examine the economy of these *Grylli*, and study their mode of life; but they are so shy and cautious, that it is no easy matter to get a sight of them, for hearing a person's footsteps as he advances, they stop short in the midst of their song, and retire backward nimbly into their burrows, where they lurk till all suspicion of danger is over.

At first we attempted to dig them out with a spade, but without any great success; for either we could not get to the bottom of the hole, which often terminated under a great stone, or else in breaking up the ground we inadvertently squeezed the poor insect to death. Out of one so bruised we took a multitude of eggs, which were long and narrow, of a yellow colour, and covered with a very tough skin. By this accident we learnt to distinguish the male from the female; the former of which is shining black, with a golden stripe across its shoulders; the latter is more dusky, more capacious about the abdomen, and carries a long sword-shaped weapon at her tail, which probably is the instrument with which she deposits her eggs in crannies and safe receptacles.

When violent methods will not avail, more gentle means will often succeed, and so it proved in the present case; for, though a spade be too boisterous and rough an implement, a pliant stalk of grass, gently insinuated into the caverns, will probe their windings to the bottom, and quickly bring out the inhabitant, and thus the humane inquirer may gratify his curiosity without injuring the object of it.

It is remarkable that, though these insects are furnished with long legs behind, and brawny thighs for leaping, like grasshoppers, yet when driven from their holes they show no activity, but crawl along in a shiftless manner, so as easily to be taken; and, again, though provided with a curious apparatus of wings, yet they never exert them when there seems to be the greatest occasion. The males only make that shrilling noise, which is raised by a brisk friction of one wing against the other. They are solitary beings, living singly, male or female, each as it may happen. When the males meet they will fight fiercely, as I found by some which I put into the crevices of a dry stone wall, where I should have been glad to have made them settle. For though they seemed distressed by being taken out of their knowledge, yet the first that got possession of the chinks, would seize on any that obtruded upon them with a vast row of serrated fangs. With their strong jaws, toothed like the shears of a lobster's claws, they perforate and round their curious regular cells, having no fore-claws to dig, like the Mole-Cricket. When taken in hand, I could not but wonder that they never offered to defend themselves, though armed with such formidable weapons. Of such herbs as grow before the mouths of their burrows they eat indiscriminately, and on a little platform, which they make just by, they drop their dung, and never in the day-time seem to stir more than two or three inches from home. Sitting in the entrance of their caverns, they chirp all night as well as day, from the middle of the month of May to the middle of July, and in the hot weather, when they are most vigorous, they make the hills echo, and in the still hours of darkness may be heard to a considerable distance. In the beginning of the season their notes are more faint and inwards, but become louder as the Summer advances, and so die away again by degrees.

Sounds do not always give us pleasure according to their sweetness and melody, nor do harsh sounds always displease. We are more apt to be captivated or disgusted with the associations which they promote, than with the notes themselves. Thus the shrilling of the Field-Cricket, though sharp and stri-

dulous, yet marvellously delights some hearers, filling their minds with a train of Summer ideas of everything that is rural, verdurous, and joyous.

About the 10th of March the Crickets appear at the mouths of their cells, which they then open and bore, and shape very elegantly. All that ever I have seen at that season were in their pupa state, and had only the rudiments of wings lying under a skin or coat, which must be cast before the insect can arrive at its perfect state, from whence I should suppose that the old ones of last year do not always survive the Winter. They cast these skins in April, which are then seen lying at the mouths of their holes. In August their holes begin to be obliterated, and the insects are seen no more till Spring.

(*Gryllus domesticus,*) or HOUSE-CRICKET.

WHILE many other insects must be sought after in the fields, and woods, and waters, the *Gryllus domesticus,* or House-Cricket, resides altogether within our dwellings, intruding itself upon our notice whether we will or no. This species delights in new-built houses, being, like the spider, pleased with the moisture of the walls; and, besides, the softness of the mortar enables them to burrow and mine between the joints of the bricks or stones, and to open communications from one room to another. They are particularly fond of kitchens and bakers' ovens, on account of their constant warmth.

Tender insects that live abroad either enjoy only the short period of one Summer, or else doze away the cold uncomfortable months in profound slumbers; but these, residing as it were in a torrid zone, are always alert and merry: a good Christmas fire is to them like the heats of the dog-days. Though they are frequently heard by day, yet is their natural time of motion only in the night. As soon as it grows dusk, the chirping increases, and they come running forth, and are from the size of a flea to that of their full stature. As one might suppose, from the burning atmosphere which they inhabit, they are a thirsty race, and show a great propensity for liquids, being found frequently drowned in pans of water, milk, broth, or the like. Whatever is moist they affect; and therefore often gnaw holes in wet wollen stockings and aprons that are hung to the fire: they are the housewife's barometer, foretelling her when it will rain; and are prognostics sometimes, *she thinks,* of ill or good luck. These Crickets are not only very thirsty, but very voracious; for they will eat the scummings of pots, and yeast, salt, and crumbs of bread; and any kitchen offals or sweepings. In the Summer we have observed them to fly, when it became dusk, out of the windows, and over the neighbouring roofs. This feat of activity accounts for the sudden manner in which they often leave their haunts, as it does for the method by which they come to houses were they were not known before. It is remarkable that many sorts of insects seem never to use their wings but when they have a mind to shift their quarters and settle new colonies. When in the air they move *volatu-undoso,* in waves or curves, like *woodpeckers,* opening and shutting their wings at every stroke, and so are always rising or sinking.

When they increase to a great degree, they become noisome pests, flying into the candles, and dashing into people's faces: but they may be blasted and destroyed by gunpowder discharged into their crevices and crannies. Their shrilling noise is occasioned by a brisk attrition of their wings. Cats catch hearth-crickets; and, playing with them as they do with mice, devour them. Crickets may be destroyed, like wasps, by phials half filled with beer, or any liquid, set in their haunts; for, being always eager to drink, they will crowd in till the bottles are full.

(*Gryllus gryllo talpa,*) or, MOLE-CRICKET.

How diversified are the modes of life not only of incongruous but even of congenerous animals; and yet their specific distinctions are not more various than their propensities. Thus, while the *Field-Cricket* delights in sunny dry banks, and the *House-Cricket* rejoices amidst the glowing heat of the kitchen hearth or oven, the *Gryllus gryllo talpa,* (the Mole-Cricket,) haunts moist meadows, and frequents the sides of ponds and banks of streams, performing all its functions in a swampy wet soil. With a pair of fore-feet curiously adapted to the purpose, it burrows and works under ground like the mole, raising a ridge as it proceeds, but seldom throwing up hillocks.

As *Mole-Crickets* often infest gardens by the sides of canals, they are unwelcome guests to the gardener, raising up ridges in their subterraneous progress, and rendering the walks unsightly. If they take to the kitchen quarters, they occasion great damage among the plants and roots, by destroying whole beds of cabbages, young legumes, and flowers. When dug out they seem very slow and helpless, and make no use of their wings by day; but at night they come abroad and make long excursions, as I have been convinced by finding stragglers, in a morning, in improbable places. In fine weather, about the middle of April, and just at the close of day, they begin to solace themselves with a low, dull, jarring note, continued for a long time without interruption, and not unlike the chattering of the fern-owl, or goat-sucker, but more inward.

About the beginning of May they lay their eggs, as I was once an eye-witness; for a gardener, at a house where I was on a visit, happening to be mowing, on the sixth of that month, by the side of a canal, his scythe struck too deep, pared off a large piece of turf, and laid open to view a curious scene of domestic economy.

There were many caverns and winding passages leading to a kind of chamber, neatly smoothed and rounded, and about the size of a modern snuff-box. Within this secret nursery were deposited near an hundred eggs of a dirty yellow colour, and enveloped in a tough skin, but too lately excluded to contain any rudiments of young, being full of a viscous substance. The eggs lay but shallow, and within the influence of the sun, just under a little heap of fresh moved mould, like that which is raised by ants.

When Mole-Crickets fly, they move *cursu undoso,* rising and falling in curves, like the other species mentioned before. In different parts of this kingdom people call them *fen-crickets, churr-worms,* and *eve-churrs,* all very apposite names.

Anatomists who have examined the intestines of these insects, say, that from the structure, position, and number of their stomachs, or maws, there seems to be a good reason to suppose that this and the two former species *ruminate* or *chew* the *cud* like many quadrupeds.

[WHITE'S *Natural History of Selborne.*]

IT is a most Christian exercise to extract a sentiment of piety from the works and appearances of nature.—CHALMERS.

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KILLARNEY. No. VII.

MACGILLICUDDY'S REEKS, FROM AGHADOE.

THE MOUNTAINS—MACGILLICUDDY'S REEKS.

As the two lower lakes at Killarney lie at the foot of the range of mountains upon which the third, or Upper Lake is situated, the side of them turned towards that lake, or, in other words, their western shores, are bounded by those mountains. The first mountain in the chain which thus separates the Lower Lakes from the Upper Lake is that of Turk. It forms the boundary of the south-western side of the middle lake, which has from that circumstance received the appellation of Turk Lake. By the side of this mountain there is a defile in the chain, through which flows the river from the Upper Lake.

The next mountain to the northward, or that upon the opposite side of the defile, is Glena, which bounds a portion of the western side of the Lower Lake. It projects forward beyond the line of Turk Mountain, and forms, in fact, a promontory jutting out into the lake; thus it presents two sides to the water, one of them overhanging the bay of Glena, as the corner of the lake to the southward is called, and the other opening to the northward upon the broadest part of the lake. Both of these mountains rise abruptly from the water, and are marked by numerous bold breaks and projecting rocks. The summit of Glena mountains is "bare, naked, barren, wild, and rugged," while the base is clothed with trees of rich and varied shades, almost dipping their foliage in the water

Tomies Mountain, the next in succession to the northward, and the last whose base is washed by the lake, rises more gradually than the others, and at its sloping base presents to view a considerable tract of fertile ground, which is under cultivation.

Until the sun has ascended to his meridian height, the mountains bordering upon the Lower Lake remain in shadow. Their surface then appears tame and unvaried, and their summit, if it be in clear weather, forms a hard outline against the azure sky; but, as the day advances, the sun crosses the line of the great chain, and darts his rays on that side of the mountains which lies next to the lake. All their bold irregularities are then revealed, their protruding rocks, their deep glens; "and the lake, illumined by the gleams which pass athwart its peaceful waves, appears resplendent amidst the dark and wooded islands:"—

> ..... The horizontal clouds
> With purple dyes and fissures edged with gold,
> Streak the calm ether, while through the sparkling haze
> The faint hills glimmer; fainter as their chains
> Approach the fount of brightness; fainter still
> Where sunk the parting orb, and with the sky
> In undistinguishable splendour joined.

Mr. Weld says that he has sometimes imagined that the sun set with more splendour at Killarney than in other parts of the country; indeed, he adds, there can be no doubt that the diversity of light and colours in the sky is augmented by the vast collections of clouds which are attracted by the mountains as they come from the Atlantic,—

> Or whirled tempestuous by the gusty wind,
> Or silent borne along, heavy and slow,
> With the big stores of steaming ocean charged.

These clouds, he says, not only occasion the most grand and beautiful effects at the approach of evening, but "exhibit infinite vicissitudes of light and shade throughout the day, altering every hour the face of the landscape." An older writer expresses a similar opinion, stating that the effect of the view is, in his opinion, much heightened by the hourly revolutions in the face of the heavens.

The vast volumes of clouds which are rolled together from the Atlantic and rest on the summits of the mountains, clothe them with majesty: the different masses of light and shade traversing the lakes in succession, as the shifting bodies above float across them, exhibit all the varieties of night and day almost at the same instant: the mists interposing their dull yet transparent coverings to the view, raise new desires of a fallen and clearer prospect: and the wandering vapours flitting from cliff to cliff, as if in search of the clouds from which they have been separated, amuse the eye with their varieties and irregular motions.

But "every white will have its black." The clouds and mists at Killarney, like clouds and mists elsewhere, bring with them something more than majesty to the prospect; and occasion other "vicissitudes" than those of light and shade in the face of the landscape. The west of Ireland is remarkable for its rains; and certainly in no part of it is that feature of the climate so prominently developed as at Killarney. Hence arises a serious drawback upon its attractions; or as the writer last quoted says,—

After all this happy spot labours under one disadvantage, and one, too, which I am the more averse to mention, since so celebrated a writer as Dr. Johnson has thought it sufficient in the case of Loch Lomond, to counterbalance so many natural beauties; and this is no other than the immense rains; which fall here more abundantly, and that even in the best seasons for visiting the lake, than in all other parts of the kingdom.

Upon this account a lengthened residence at Killarney is necessary to a full enjoyment of its beauties. The space assigned for the regular performance of the tour is three days,—though, to accommodate all classes, a mode has been devised of "doing it" in two, or even in one day. But, for the ordinary traveller to expect three consecutive fine days under the sky of Killarney, would be scarcely more reasonable than asking for the ocean in the deserts of Africa. Yet to this very drawback upon the attractions of Killarney, we trace those attractions themselves; and instead of complaining, we shall do well to recollect that the limitations here set to our pleasures are necessary to our being pleased at all, that what we at first call a disadvantage is the spring and source of all we admire,—

That the Hyades are here the handmaids of Flora; for that without their perpetual effusions of rain we complain of, the rocks must resign their vegetable inhabitant, the rivers mourn their exhausted urns, and the cascades no longer resound in the dull ear of memory; that the living lake itself must dwindle into an inconsiderable pool, and the mountains stripped of their honours become a dreary waste, the abode of gloom and barrenness.

We have said that the mountains of Glena and Tomies are seated upon the western bank of the Lower Lake. Beyond them, still further to the westward, is a range of other mountains which runs towards the Atlantic, in a direction at right angles to theirs, or in such a manner that if it ran towards the east instead of towards the west, it would cut the lake in half. This range bears the name of Macgillicuddy's Reeks, the appellation of Macgillicuddy being derived, according to the common account, from an old family once flourishing in these parts, and that of Reeks being applied to the mountains because of their sharp jagged peaks. One of these peaks called Carran Tual, or Gheraun Tual, (from some resemblance in it to an "inverted sickle,") is the loftiest summit of all Ireland, measuring 3394 feet.

As the Reeks lie behind the mountains which bound the western bank of the Lower Lake, they are, of course, not to be seen from every point of view; if the spectator be too close they are hidden. From the hills upon the opposite or eastern side of the lake they appear to advantage, towering above the heads of Glena and Tomies. But the best view of them is obtained from the hills upon the northern border of the lake; and this is the view which is represented in our engraving, the spectator being placed on the hill of Aghadoe, close to the ruins of the ancient cathedral of that name. The extensive prospect which this height commands is constantly recommended to the tourist; and certainly it is one of the most remarkable which he will enjoy at Killarney.

From hence (says Smith, the historian of Kerry), is to be seen one of the most delicious landscapes in Ireland, and perhaps few countries in Europe afford better; but this is such a masterpiece, that even the Poussins, Salvator Rosa, or the most eminent painter in that way, might here furnish himself with sufficient matter, not only to form one but several entertaining prospects. From this eminence a survey may be taken of the greatest part of this beautiful lake, and likewise of that stupendous amphitheatre of mountains which are raised along the opposite shores. Towards the south-east stands the mountain called Mangerton, whose feet the lake washes, and whose summit is generally lost in the clouds, it being justly esteemed one of the highest mountains in Ireland*. More towards the centre of the lake is a high mole, called Turk, whose sides, down to the verge of the water, are beautifully clothed with groves of various kinds of trees. One part of this hill slopes away like a promontory terminating in the lake, forming one side of a canal, which is a passage into the Upper Lake, as doth the front of another mountain, called Glena, the other side of this strait, which is adorned also with forest trees. As a fine contrast to this verdure, at the backs of these mountains stand others shaped into pyramids, being only naked rocks of a vast height. The grandeur and magnificence of these mountains, not only entertain and surprise the spectator, but he must be also agreeably amused in contemplating the infinite variety of beautiful colouring they afford. For in this part may be seen the gayest verdure, blended with scarlet fruit and snowy blossoms, well known properties of the *Arbutus;* and in other places the most elegant variety of brown and yellow tints, caused by other kinds of trees and shrubs, appears; all these are intermixed with rock-work, and, to soften the whole, a deep, smooth, and noble basin of water extends itself beneath this scenery; but to give the reader an adequate idea of this place would require the pencil of some excellent painter rather than the pen of any prose writer.

To the west of Glena stands the lofty peak called Tomish, variegated half-way to its top with a waving forest, and down whose sides, especially after rains, run very considerable cataracts into the Great Lake. There are many other hills still running more west, as far as the eye can reach, for many miles; the nearest, and most surprising for their loftiness, are the *Reeks*, already mentioned, whose tops resemble so many pinnacles, or rather spires, lost in the clouds.

Carran Tual being the highest mountain in Ireland,

* When Dr. Smith wrote, Mangerton was generally considered the highest mountain in Ireland, although it is nearly nine hundred feet lower than its close neighbour Carran Tual;—a fact which shows most strikingly how fallacious a guide is the appearance of mountains in estimating even their comparative height.

the ascent to its summit forms a notable exploit with the more active and adventurous of the visiters to Killarney. The excursion, though a fatiguing one, is unattended with danger; and it affords many fine mountain scenes which, even without the extensive prospect from the summit, would be amply sufficient to reward the traveller for the toil of the ascent. Even the lower Reeks are well worth the labour of a visit; Mr. Weld ascended one of them, which the ignorance of his guides led him to mistake for Carran Tual, and he described the scenery which he beheld as sublime in the extreme. The party proceeded first to Dunloh Gap *, and having advanced into it to the distance of half a mile, began to ascend the mountain on their right. It proved extremely difficult of access, and in many parts so steep, that, without the aid of the sapling oaks which spring from their fissures, it would have been impossible to scale the rocks. On the summit of this mountain they found an extensive tract of ground, less encumbered with rocks than the valley below, and covered, as far as the eye could see, with heath and coarse grass, on which innumerable herds of cattle were fed. Beyond it appeared another mountain extremely rugged, which they reached at the end of two hours. The ascent was not steep; but it was laborious and tedious, owing to the immense heaps of loose stones in some places, and in others deep rents, which could not be passed without the utmost caution. Along this part of the route, the only animals they observed were eagles, of which numbers hovered above them as if alarmed at the invasion of their lofty solitudes: at one moment they counted no less than twelve of them within gun-shot.

The craggy tops of the Reeks appeared on reaching the summit of this latter mountain; and after walking for about an hour over a rugged way, nearly similar to that which they had already traversed, they gained one of the loftiest pinnacles, which their guides told them was Carran Tual.

It is scarcely possible (says Mr. Weld), to convey an idea of the sublime view which was now unfolded to our eyes. On each side lay a vast precipice, beyond which arose other immense mountains: still further on we saw the Atlantic Ocean bounding the horizon for a great distance; and in the opposite direction a wide expanse of the inland country, watered by innumerable rivers and lakes, among which that of Killarney was only conspicuous for its superior extent. One of the peaks before us seemed to be considerably more lofty than that which we had ascended; but the guides persisted in assuring us that the appearance was deceptive; and that if from any third station we could compare its elevation with that of the point on which we then stood, the superior height of the latter would be obvious. The intervening precipices were impassable; as it was out of our power, therefore, to make the trial, we were satisfied to receive this intelligence as conviction; and, perhaps, none of us, after so much fatigue, were willing to entertain a doubt of having attained the object of our laborious undertaking.

The mountain here described resembles in shape a wedge; at the summit it presented a long craggy ridge, so narrow, that whilst they stood upon it we could look into the depths of the precipices at either side, or drop pebbles into them from each hand at the same moment. Large masses of rock are often detached from the ridge, through the incessant action of mists and vapours prevailing in these high regions, and especially after the snow begins to dissolve. They roll down the mountain with a loud roar, but fortunately there are no dwellings which they can reach in their descent.

The party descended the mountain by the opposite side, under the full impression that they had scaled its highest peak, and directing their steps towards the Upper Lake, reached a cottage at which they rested.

On recounting the adventures of the day, and boasting of having been on the highest ground in Ireland, an old gray-headed man who stood by expressed some doubt of the fact; adding that if we had really been on the most lofty point of the Reeks, it would have been impossible for us to have returned before night. We appealed to our guides, who, jealous of their reputation, of course confirmed our story; to put this matter beyond doubt, however, the old man requested us to come to the door and point out the mountain we had ascended. The Reeks rose in full view before the cottage, and we could easily trace our route to the most lofty peak. This was sufficient to confirm his first supposition. Gheraun-tuel, he told us, was much higher than any of the other points, and was neither visible from the valley in which we stood, nor from any part of the lake of Killarney. It was to no purpose that the guides maintained the contrary, the evidence of our own senses had already impeached their knowledge, and their ignorance of the country was now proved by the concurrent testimony of several mountaineers. The difficulty of ascending Gheraun-tuel was represented to us as very great, and no stranger, we were told, had ever attempted it. This was but an additional incentive to undertaking the enterprise; and the old man having offered his son as a guide, the next day but one was appointed for the expedition.

There are two routes by which the ascent of Carran Tual is now made. By one of them the traveller proceeds along the northern shore of the Lower Lake to Dunloh Castle, and keeps a straight course beyond it in the same direction, after skirting the northern side of the Reeks for some distance, until he arrives at that part of their base above which towers the object of his search. The other route is by the Upper Lake, whence he enters a valley which leads him to a similar point on the opposite or southern side of the Reeks.

The valley through which the latter route conducts him bears the name of Comme Duff, or the Black Valley; it is watered by a chain of small lakes and a river connecting them together. This valley bears some resemblance to the Gap of Dunloh; but the scenery is much tamer, and is rather to be admired for the delightful verdure of the peaceful and retired meads than for the boldness of the rocks, or the height and abruptness of the impending precipices. After passing into another valley, which branches off from this, and proceeding for a considerable distance, he begins to climb a mountain, which, though steep, is not difficult of ascent; on the summit is a long plain, which forms the body, as it were, of the mountain mass out of which the Reeks rise. At the end of this plain, which is covered with coarse grass, is seen the conical head of Carran Tual. Advancing towards it the traveller has to proceed four or five miles before it discloses itself fully to his view; at length he reaches the brink of a precipice, when a complete view of it opens. Mr. Weld thus describes its appearance:—

It rose with great regularity in the form of a cone, and to appearance stood quite insulated except on the nearest side, where it was connected with the mountain on which we stood by a sort of spur, forming an isthmus, and bearing a resemblance, though on a scale of such great magnitude, to the artificial approach to an old castle. At the height from which we viewed it, this pass did not seem to be wider than might be sufficient for a single carriage; and though on descending we found it at least sixty feet broad, yet the immense depth and great abruptness of the precipices at each side so imposed on the senses, that we could scarcely persuade ourselves of being in perfect safety in its very centre. Here, however, we halted at once to admire the sublimity of the scene, and to take some refreshment and repose. From this place to the summit the distance did not appear to be very great, as the slope, owing to our contiguity to the mountain, was fore-shortened; but though we advanced with ardour and the way, except being very

* For an account of this remarkable defile, see *Saturday Magazine*, Vol. XII. p. 83

steep, was not incommodious, we did not arrive at the top until an hour and a half after we had set out.

The top of the mountain presents a smooth area, nearly circular; it is about thirty feet in diameter, and from every side there is an uniform slope down. The stones are split into small flags, which, in many cases, are also broken crosswise; thus the summit is composed of a species of shingle, which, after a heavy fall of snow, is carried down in considerable quantities in the thaw; for this reason it has been said, that the height of the Reeks has probably diminished in the lapse of time.

From the summit of Carran Tual a most commanding view is obtained. To the north, Dingle Bay, and the whole of the sea-coast between it and the river Shannon; and in the opposite direction, Kenmare River, Bantry Bay, and the other great estuaries in this part of Kerry, are all distinctly spread out. The other rocks appear like so many inclined planes, whose angles of inclination are all equal, so that they appear to lie in parallel strata. On the tops of several are small lakes, like those on Mangerton and other high mountains on the range. The inland view is less interesting than that obtained from others of the Reeks whose height is not so great; few of the lakes can be distinguished, and the beauty and variety of the scenery surrounding them is lost in the immensity of the distance. The spectator gazes with wonder upon the stupendous prospect which is spread around him, but the intense cold prevailing at this lofty elevation, renders unpleasant a stay of any length on the summit of Carran Tual.

The descent from the isthmus or ridge, which connects Carran Tual with the other Reeks, into the valley of Comme Duff, is tedious but not difficult, the steepness of the declivities rendering it exceedingly fatiguing. Mr. Weld, who descended on this side, speaks of his route as somewhat hazardous. He tells us, that shortly after leaving the isthmus, his party were conducted to a precipice, at least sixty feet deep, down which they were told that it was necessary for them to take their course.

The proposal (he says) startled us, nor did we conceive how it was practicable; but the guide seating himself at the brink of it, on a rock which presented an even face nearly to the bottom of the precipice, slid down it, taking the precaution, however, to impede the velocity of the descent, by catching hold of the tufts of long grass which grew from the crevices at each side. This example was followed without hesitation; and having accelerated our descent down the steepest part of the mountain, by sliding over other rocks of a similar description, we soon reached the bottom.

Having reached the valley of Comme Duff, the visiter makes his way, over a rugged and stony path, for the distance of about four miles; when he has reached the banks of the Upper Lake, it is customary to have a boat in waiting, by previous arrangement, to convey him homeward. It will be late before he arrives at the town of Killarney; sixteen or seventeen hours are scarcely sufficient for the whole day's excursion, so that if he have started as early as five in the morning, he will not return much before midnight.

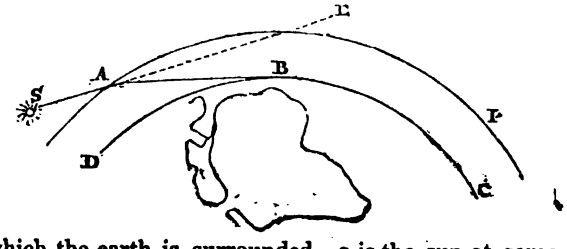
Besides Glena and Tomish there is another mountain adjoining the Reeks, which is deserving of notice. It is connected with that of Glena, and with it forms one side of the Gap of Dunloh, the Reeks forming the other. This mountain is called the Purple Mountain, from the large loose fragments of stone about its summit, the débris of the rugged cliffs of a dark purplish clay-slate, which give to the mountains that hue when viewed from a distance below. From Mr. Barrow's account it seems to be deserving of a visit.

I made the ascent (he says) in about an hour. The day was as fine as ever shone from the heavens; it was one day in a hundred, as the guide remarked, not a cloud to interrupt the view, and the whole range of Macgillicuddy's Reeks, with their peaked and jagged summits lay beautifully before me. The prospect was varied, extensive, and grand. On the west was the silver stream of the Laune, meandering into Dingle Bay, and a little to the left the great cluster of the Iveragh Mountains; on the south-west, the River and Bay of Kenmare; on the south, and close at hand, the rounded and unsightly summit of Mangerton, boasting an elevation of about 2550 feet; and on the east, the grounds and Abbey of Mucruss; but Ross Castle, with its well-planted island, and beyond it the town of Killarney, were from this point hidden from the sight. On the summit of the Purple Mountain a heap of stones was piled up, on which I suppose the officers employed in the Trigonometrical Survey of Ireland had fixed their staffs, as these piles are observable on all the highest points in the island.

TWILIGHT.

IN those portions of the globe where the atmosphere is frequently obscured by clouds and mists, and where the nights in some parts of the year greatly exceed the days in length, we enjoy the cheering influence of light for a short time before the sun has actually risen, and again after it has set. This mellow and pleasing light, which we call twilight, arises from the refractive power of the air, by which the rays of the sun are bent from their direct course, and partially illuminate the earth for a limited time after it has set, and before it has risen.

The mode in which this beautiful effect is produced may be illustrated by the following diagram. Let D B C represent part of the circumference of the earth, and the line A P the boundary of the atmosphere by



which the earth is surrounded; S is the sun at some distance below the horizon, that is, out of the sight of an individual placed at B, and consequently a ray of light proceeding in the direction S A E could never reach the earth at B, if it was not for some counteracting cause: this cause we find in the refractive power of the atmosphere. (We have explained the phenomena of refraction in the *Saturday Magazine*, Vol. XI., p. 77.—Amusements of Optics.) The ray of light in its passage towards E meets with the atmosphere of the earth somewhere about A, and is bent from its direct course towards B, so that those who live at B on the earth's surface enjoy the effects of the sun's rays for a considerable time after that luminary would be otherwise out of sight.

Twilight varies in duration at different times of the year, and in various parts of the globe. Between the tropics it is scarcely known, the brilliant nights of these climates rendering it unnecessary; so that the passage from day to night, and from night to day, is almost without an interval. Sir Walter Scott alludes to this in his poem of *Rokeby*, when he puts these words in the mouth of the pirate Bertram Risingham.

> And now, my race of terror run,
> Mine be the eve of tropic sun:
> No pale gradations quench his ray,
> No twilight dews his wrath allay.
> With disk like battle target red,
> He rushes to his burning bed;
> Dyes the wide waves with ruddy light,
> Then sinks at once,—and all is night.

THE USEFUL ARTS. No. XXXIV*.

MASONRY.

WHEN the stone is sawed to the proper size, the surfaces which will be exposed to view, are to be made smooth and even. The tools used by the mason for this purpose consist of iron chisels, of different widths, and, principally, of a sharp-pointed one, called a *pointer;* these chisels are struck with a mallet made of a conical-formed lump of hard wood, fixed on a short handle.

The *pointer* is used for chipping off the principal roughnesses on the face and edges, and for working the whole face over to bring it level, the workman trying his work by applying a *straight-edge* occasionally to it. When the front and edges are made *true*, the face is sometimes *tooled* over, so as to leave regular furrows in it, according to certain forms, by which the different kinds of work are distinguished. But this practice is going out of use, now that soft free-stone is so much employed in building. In old edifices, such as St. Paul's, Whitehall, &c., &c., the stone will be found to be wrought on its face in the manner alluded to.

Stones in buildings are not only fixed with mortar, as bricks are, but are further secured in their places by being clamped together with iron clamps. These are short iron bars, from seven to twelve inches long, one and a half wide, and half an inch thick, according to the size of the stone; the ends of the clamps are turned down a little, to afford a better hold. A channel is cut in the two contiguous stones deep enough for the clamp to lie in, and the ends of the channel are sunk deeper, to receive the turned-down ends of the clamp; when this is put into the channel, molten lead is poured in to fill up the interstices, to keep the clamp in its place, and to prevent its rusting by wet getting to it.

From the expense of carrying and working stone, the walls of buildings at a distance from a quarry are seldom, now, built of solid stone, but a facing of this material is applied only on the external surface of the wall, which is built of brick. This kind of work is called *ashler* work, and both the brick and stone-work must be executed with considerable care, to enable a wall composed of two materials to preserve its perpendicularity; it being obvious, that if the brick part yielded to the weight, it must, from its construction, do so more than the stone facing, and, therefore, the wall would bend inwards and become crippled.

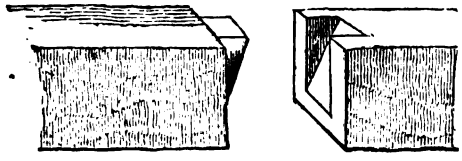
The width of the courses of ashlers must, therefore, be made equal, exactly to a certain number of courses of bricks with the intervening mortar, and the brickwork must be executed with such care, that this number of courses may be everywhere of the same width in the whole height of the wall. In every course of ashler there must be solid stones laid quite, or nearly quite, across the width of the wall, to form a *bond* to the stone facing, and all the stones of the ashler must be fixed with iron cramps to one another and to these bond-stones. But however carefully a faced wall may be executed, it is never so firm or durable as one built entirely of either material; indeed, if well executed, of good materials, and of competent thickness in proportion to its height, a brick-wall is the most durable, light, and efficient structure that can be erected.

When stone is to be cut into cornices, mouldings, &c., the blocks having been sawed, the ends top and bottom are worked very true and parallel, or perpendicular to each other, and one edge or *arris* cut to a perfectly straight line; a thin wooden mould of the section of the cornice is then applied to each end, and the profile of the mouldings marked out on the stone. The workman being guided by this figure, cuts away the stone down to the general surface of the mouldings, and then proceeds to get the flat fillets of the mouldings perfectly staight and true by the rule; these again guide him in working the curved mouldings, such as *ovolos, cavettos, cyma reetas,* and *ogees;* when these are cut nearly to their profile, and perfectly straight on the *bed* line, they are finished off by being rubbed down smooth by thin long straight-edges of stone.

Foliage and carved work is executed by a better kind of workman, possessing some of the taste of an artist, and he works on the same general principles as a sculptor when executing a statue; it would be foreign to the object of these papers, therefore, to dwell on this branch of the mason's art.

It often, or even most commonly occurs, that the distance between two columns of a portico, is of greater length than a stone can be obtained, and if the architrave, or that part of the *entablature* immediately over the capitals of the columns be looked at attentively, a stone will be perceived between the columns apparently unsupported, for neither end rests on the column, and the joints of those ends are upright, not presenting any character of a voussoir-stone or arch. The contrivance by which such an architrave stone is supported deserves to be described.

The stone in question has a projecting part, wrought at each end, of the form shown in the annexed figure; this projection is received into a corresponding cavity, cut in the end of the stone supported by the column, and the joint is thus really an arched or wedge-shaped one, though the bevel line is concealed, and the two stones, when put together, present only a vertical joint.



The mason, in common with the bricklayer, uses *squares, levels, plumb-lines,* and *straight-edges* to set out his work, and trowels and mortar to set the stones with; but the latter is rather used to make the joints water-tight than to keep the stones together, this being effected by their weight or by iron clamping. Formerly the mason required far more accurate and extensive knowledge of geometry than is possessed by persons of the trade at present; this was when he was called on to construct groined and vaulted roofs, enriched with carved work and pendent corbels, where the nicest workmanship was required, to ensure the stability of the light and graceful columns and vaulting of a Gothic cathedral. It was this possession of superior skill and knowledge that caused the establishment of the Society of Free Masons, which dates its rise from the tenth or eleventh century.

Marble, from its costliness, and the difficulty of working it, is seldom, if ever, used in solid pieces in buildings; thin facings of it are set upon stone *backings,* much as rare woods are used in *veneering* by the cabinet-maker. The marble is sawn into thin slabs, like other stone, and the face is polished by rubbing on it the surface of another piece, fine sand, mixed up with water, being used to cause abrasion.

* Continued from Vol. IX., p. 40.

PROCESSES BY WHICH THE EARTH IS CLOTHED WITH PLANTS.

No one can have seen a lake, without observing that wherever a river flows into it, the borders consist of meadows, or of marshy land, or both: while the marsh is a preliminary to the meadow, and is finally converted into one. If the whole process be watched, it will be found to commence in the shoaling of the bottom at the entrance of the river, sometimes producing islands, or banks, which, gradually attaining the level of the water, become first marshy tracts, and are finally elevated so as to form solid plains of meadow land. The progressive deposition of earth and stones by the river is here the fundamental cause: and as far as this acts on that land which has already surmounted the general level of the water, the increase is the result of inundations extending themselves over it. The consequent effects are the narrowing, the shortening, or the dividing of lakes, and ultimately their obliteration, so that nothing at length remains but a river traversing a plain; while the practical and obviously designed result is, in all cases, an acquisition of new and valuable lands. The object here is to point out that portion of the total plan which is effected by the intervention of the living and vegetable creation, through the inclinations, or instincts, of plants appointed for the completion of this great design of clothing the earth.

It is a striking proof of design, that two processes, entirely distinct in their natures, are brought to bear

on the production of one effect: the second being also prepared to follow and complete what had been commenced by the first. It is a further proof of such a regular and fore-ordained plan, that while the general inclinations and structures of the plants destined to this end are peculiar, so is there among them a still further gradation of inclination and structure: a succession of distinct desires and powers, which enable some to commence that portion of the general duty which others are to take up, and others again to terminate, while none of these can perform the office of their associates in the work. In every case, even under the absence of all analogy, we must grant that such a mode of proceeding bespeaks a design: it is impossible to doubt it for a moment, when we find man himself pursuing the same system, and, whether he knows or not that he is imitating nature, sowing vegetation to secure and consolidate the mud which his piers and dams have detained, that he may gain a new territory from the waters.

In the proceedings of nature, however, the plan is more perfect; and while the results are more numerous, the provisions for each are as minute and accurate, as the effects themselves are unfailing. Not only is the new land consolidated, but the plants are constructed with powers to detain what would otherwise have floated on with the stream, to be lost in the ocean; that most valuable portion of the whole deposit, on which the unceasing fertility of these new lands is to depend. And while the living plants serve to detain and to bind, the dead ones are ordained, in their generations, to fertilize, and, still further, to aid in elevating the new plains beyond the eventual inroads of the waters. A short list, selected from a numerous catalogue of plants, will furnish that detailed evidence which the reader can easily verify and extend.

In the sea, it is the Zostera chiefly, which, with its long, numerous, and firm roots, lays the first foundation of that which will afterwards become a salt-marsh; acting beneath the water, like those far different plants which consolidate the dry sands of the adjoining shores. In fresh-water lakes the Scirpus ocicularis, Subularia aquatica, and others, perform the same initial duty: and when we find that all these plants have been created to live and to propagate entirely under water, we cannot doubt that they were appointed to the very office which they execute so well. But in fresh waters, if not, with us at least, correspondently, in the sea, the detension and consolidation of earthy matters are effected by many more plants, not purely subaqueous; but of an amphibious nature. These root beneath the water, but grow above it; acting by means of their stems and their crowded growth, in detaining what their roots consolidate, or checking that action of the waves which would diffuse the earths along the bottom, and retard the desired effect. Such are the bulrush and the common reed. The student of nature should examine for himself the various plants, Nymphœas, Charas, Hottonia, Butomus, &c., which take their shares in this useful work. But it is most important to remark that there is some one, or more, adapted to every possible situation and circumstance under which this work may be carried on. Thus have structures and inclinations been provided, not merely for the sea and for fresh water, but for every variety of each: for the pure ocean, and the brackish æstuary of a river, for the clear lake, the rapid river, the alpine pool, the heated pond, and the foul and stagnant ditch. The Scirpus maritmus and the Ruppia thrive where the bulrush and the Potamogetons could not exist; the Lemna does its best to reclaim that pond which would bear no other plant: the Lobelia shuns the poisonous ditch which the Hydrocharis prefers, and the Ranunculus aquatilis, appointed to this duty in that shallow pool which the first heats of Summer evaporate, is equally content to live beneath the water, and on the dry land; amply provided with means, as with inclinations, for each mode of life. But he who would scan the whole of this great design, must investigate all this; while, if he would see, under one striking view, what the Author of nature effects in this manner, he must not confine himself to the rivers or the lakes, the marshes or the coasts of our own country, but turn the eye of botany and geography on the singularly rooted mangroves, the gigantic reeds, and other uncounted plants, which cover the swamps of the torrid climates, and are daily converting unnumbered miles of sea, and river, and lake, into habitable land. He will not doubt the ultimate value of the result, when he finds the marshy woods of Borneo, occupying hundreds of square miles, all gained from the ocean by the labours of the vegetable world.

The plants, however, which had performed the work thus far, can do no more when once the new land has surmounted the surface of the water. A new set therefore has been appointed to carry it on to its completion. The Salicornia, Arenaria, &c., perform, on the sea shores, that for which there are provided, near fresh waters, marsh plants beyond numbering, including even trees, like the willows with us, and the palms in hot countries, which aid in the great work. Thus does the marsh at length become a plain, fitted for pasturage or agriculture, or demanding only the further labours of him for whose use it was rescued from the waters. The last race has deserted it, as preceding ones had abandoned what they had produced: yet each is still performing its appointed duties: and, if excluding itself by its own actions when it could no longer be useful, continuing to prepare a new place for its successors, to surrender it again when it has executed the will of Him, of whom it is the blind but obedient agent.

An analogous but different proceeding must here be noted, independently of water. This consists, fundamentally, in the deposition of sand on sea shores; the winds performing, in this case, what the water does in the other. And however injurious the consequences may occasionally be, in the overwhelming of fertile lands, I have little doubt that the general results are beneficial, as that the whole was designed. Mankind is ever more ready to complain of injuries than to be thankful for advantages.

If this sand is not universally calcareous, it is such far most commonly: while, as the produce of sea shells, the levity of the fragments allows this kind, at least, to be most widely dispersed, so as to become calcareous manure to places within its reach, and thus producing valuable collateral effects, in addition to the accession of territory thus gained from the bottom of the sea.

Here, as in the case of deposits from water, the prime object was consolidation, that the winds might not destroy what they had produced; and the second was to induce a more fertile surface, by the addition of vegetable matter. And both are accomplished by the same means, through a special creation of plants, provided with inclinations to occupy those places, and powers to effect these purposes. All of them are willing to grow in sand and some will grow nowhere else; while the others, equally prospering on the incipient pasture, form the connecting link through which it is to be completed. Here alone we see the proofs of design: but no doubt can remain

when we examine the long roots of these plants, tenacious as they are numerous, and intersecting the sand in every direction, as if the root, rather than the plant, was the contrivance and the object, and thus rendering it a firm mass.

Among these, on our own shores, the Elymus, Triticum, Arundo, and Carex of the sand, are the most familiar, as they are the pioneers in this great work; but few can be unacquainted with the Convolvulus, Bunias, and Euphorbias, of the sea shores, with the Eryngo, the Matthiola, the Kali, &c.: while, knowing the general desires of plants for soil and water, we might wonder at a choice so apparently unreasonable, did we not know by whom that choice was directed.

Though the chemical powers of nature convert the rock into soil, that operation is often slow. There are situations also where soil cannot rest; or else it becomes removed, from the flow of water. Here it is, that the vegetable agents are ordained to act, as here they are made to inhabit; and from this point their actions are most easily traced. And when we find that a specific family of plants, utterly unlike all others, in their instincts or affections, as in their nature, their structure, and their powers, execute this prime office, surrendering their places afterwards to a second, scarcely less remarkable in these respects, yet approaching nearer to the general vegetable world; as they are also the immediate precursors of those more perfect and more widely useful plants, we cannot for an instant doubt the design. It is in the multitudinous and incomprehensible tribe of lichens and analogous plants, that we find these pioneers of vegetation, seeking their places where no others could exist; demanding no water, requiring no soil; rootless, leafless, flowerless, if not seedless, perpetuated we know not how, unsusceptible of injury short of destruction, and, if not immortal, tenacious of life as are the seeds of plants themselves, and capable of almost equal dormancy. What their anatomy is, no one has ascertained; and if they do produce seeds to be spread by the winds, we have still to explain how that which must be lighter than the winds themselves, and which the microscope cannot discover, should adhere to the solid rock.

But the Creator has only to will, and it is done: nor can we contemplate this extraordinary form of vegetable life, without reflecting on the power which has given that life to such an organization, so unlike to almost all else, yet so perfectly adapted to the purposes which it was created and commanded to serve. And if the species are so numerous that they are yet uncounted, so are there kinds allotted for different qualities of rock, and for different surfaces; for the calcareous and the flinty, for the smooth and the rough, for the precipice, or the wall, or the bark of a tree. Thus also are there individuals appointed for the damp and dark forest, the sunny and arid cliff, the frozen Alpine summit, and the salt sea shore, the climate of Bengal, and the snows of Greenland.

It is a general law for plants that water is essential to their existence, and that deprived of this, once dried, they are irrecoverably dead; though many have been enabled to retain it with almost miraculous obstinacy under the most unfavourable circumstances. But had this law involved the lichens, it would have been fatal to their appointed duties; while their bulk and structure are commonly such as to have rendered the retention of moisture impossible. Exposed to a burning sun, on naked rocks, and without the means of resisting its influence, they are often so dried as to crumble at a touch: while this condition is sometimes of daily occurrence. Their very races might have been exterminated; but the Creator never leaves his work imperfect. He has made an exception to the general law: the principle of life is not withdrawn, and they are ready to revive and resume their functions at the slightest return of moisture.

In whatever way the foliaceous and the shrubby lichens may assist, the result is to lay the foundation of a soil on the naked rock, partly through their own living structures, partly through their decomposition, and partly through the flying particles of earth which they detain. But the soil thus produced is unfitted to give a hold or a place to the larger and more perfect vegetables. A new tribe of plants, of a higher organization than their precursors, yet inferior to those which are to follow, has been created for this end. These are the mosses, and their variety resembles that of the lichens. These have scarcely the power of rooting themselves on a naked surface, if we except the barks of trees; but they attach themselves readily to the least quantity of soil, as formed and collected by the lichens: and that they execute the office of forming additional soil, the least observation will show.

Their office being at length performed, there is room and lodgment afforded for plants of greater bulk and more perfect structure: and he who examines the summit of a wall where the grasses, the Arabis Turritis, Sedum, &c. are rooted in their mossy cushions, will see those plants which are destined to replace their immediate predecessors, still adding to that soil which may one day bear the trees of the forest.

Let him who reads or observes never forget that in all this, as in everything else, there is nothing casual, nothing purposeless, nothing undesigned: that good ends have been intended, as good purposes have been effected; and that all creation everywhere presents to him who will examine it, the most incontrovertible proofs of a Great Artist, intending, designing; perfect in wisdom, and absolute in power.

[Abridged from MACCULLOCH's *Proofs and Illustrations of the Attributes of God.*]

TO A WATERFOWL.

Whither 'midst falling dew,
While glow the heavens with the last steps of day,
Far through their rosy depths, dost thou pursue
Thy solitary way?

Vainly the fowler's eye
Might mark thy distant flight to do thee wrong,
As, darkly painted on the crimson sky
Thy figure floats along.

Seek'st thou the plashy brink
Of weedy lake, or maze of river wide,
Or where the rocking billows rise and sink
On the chafed ocean-side?

There is a Power whose care
Teaches thy way along that pathless coast
The desert and illimitable air,
Lone wandering, but not lost.

All day thy wings have fanned,
At that far height, the cold thin atmosphere!
Yet stoop not, weary, to the welcome land,
Though the dark night is near.

And soon that toil shall end,
Soon shalt thou find a Summer-home, and rest,
And scream among thy fellows: reeds shall bend
Soon o'er thy sheltered nest.

Thou'rt gone, the abyss of heaven
Hath swallowed up thy form; yet, on my heart,
Deeply hath sunk the lesson thou hast given,
And shall not soon depart.

He, who from zone to zone,
Guides through the boundless sky thy certain flight,
In the long way that I must tread alone,
Will lead my steps aright.—BRYANT.

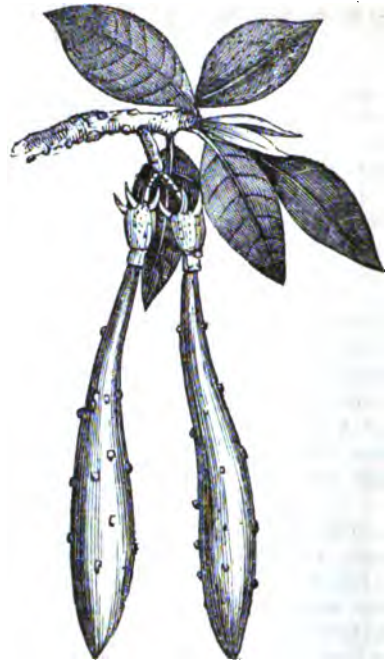
NOTES ON FOREST TREES. No. XXII.

THE MANGROVE, (*Rhizophora manglier.*)

THE trees of this tribe are peculiar to the shores of the oceans and large rivers of the tropics, where they form dense forests, reaching almost to the waters. The Mangrove is a tree about fifty feet in hight, and its mode of growth is very singular, resembling that of the banian, or Indian fig. The tree is only found in marshy places: its branches, after growing for some time in the usual manner, suddenly bend downwards and grow towards the earth; as soon as they reach the moist soil, they take root, and thus each branch forms a stem capable of supporting itself without dependence on the parent tree; in this manner one tree will, in course of time, form a complete grove. The forests thus formed by an assemblage of Mangrove trees are almost impenetrable, and in addition to the difficulties offered by the thickness of their growth, their recesses are the favourite haunts of myriads of musquitoes, sufficient to deter the most enduring from the attempt to explore them. An innumerable quantity of birds, chiefly aquatic, take shelter under their branches, while the shallow pools which abound among them form the lurking places of thousands of crabs and of aquatic insects. These amphibious forests are at times inundated by the sea, and on the retreat of the water, numerous oysters and other shell-fish are found adhering to the trees. So that, although the difficulty of penetrating these thick shades is very great, the enterprising sportsman is tolerably sure of being well rewarded for the dangers he has to undergo by an abundance of game.

A singular fact is attached to the history of the Mangrove, namely, the germination of the seeds while they are yet attached to the branches of the tree; these afterwards fall and take root in the ground.

The wood of the Mangrove is good for little else than fuel, but the bark and the seed-vessels are used in tanning hides and in dyeing black.



There are as many as four or five species of the Mangrove, whose native countries are the warmer parts of the New World, and the coast of Malabar in the East Indies.

THE regard to the general rules of morality is what is properly called a sense of duty; a principal of the greatest consequence in human life, and the only principle by which the bulk of mankind are capable of directing their actions. There is scarce any man who, by discipline, education, and example, may not be impressed with a regard to these general rules of conduct, as to act upon almost every occasion with tolerable decency, and through the whole of his life, avoid a tolerable degree of blame. Without this sacred regard to the general rules of morality, there is no man whose conduct can be much depended upon. It is this which constitutes the most essential difference between a man of principle and honour, and a worthless fellow. The one adheres on all occasions, steadily and resolutely to his maxims, and preserves through the whole of his life, one even tenour of conduct. The other acts variously and accidentally, as humour, inclination, or interest, chance to be uppermost.—ADAM SMITH.

THE willow which bends to the tempest, often escapes better than the oak which resists it; and so, in great calamities, it sometimes happens, that light and frivolous spirits recover their elasticity and presence of mind sooner than those of a loftier character.—SIR WALTER SCOTT.

YOUTH is the time of enterprise and hope; having yet no occasion of comparing our force with any opposing power, we naturally form presumptions in our own favour, and imagine that obstruction and impediment will give way before us. The first repulses rather inflame vehemence than teach prudence; a brave and generous mind is long before it suspects its own weakness, or submits to sap the difficulties which it expected to subdue by storm. Before disappointments have enforced the dictates of philosophy, we believe it in our power to shorten the interval between the first cause and the last effect; we laugh at the timorous delays of brooding industry, and fancy that by increasing the fire we can, at pleasure, accelerate the projection.—JOHNSON.

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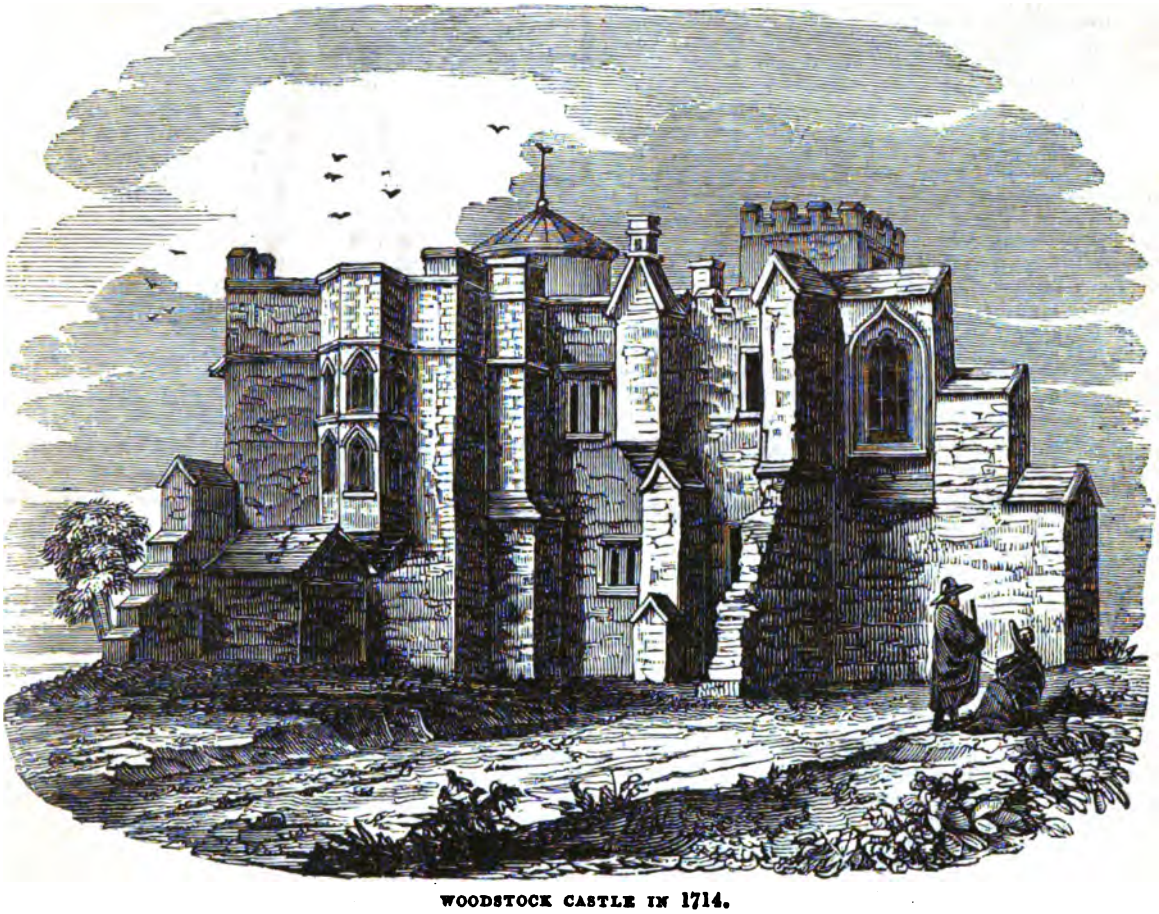
QUEEN ELIZABETH; HER PROGRESSES AND PUBLIC PROCESSIONS. No. V.



WOODSTOCK CASTLE IN 1714.

CONFINEMENT OF THE PRINCESS ELIZABETH IN THE TOWER—HER REMOVAL TO WOODSTOCK.

In our last paper upon this subject we related how, immediately upon the breaking out of Sir Thomas Wyat's rebellion in February, 1554, the Princess Elizabeth was arrested in her house at Ashridge, by the orders of Queen Mary, and brought up to London with as much speed as was compatible with her delicate state of health. When the princess reached Whitehall, she was shut up a close prisoner, under the charge of the chamberlain and vice-chamberlain, without being permitted to hold communication with any one, for nearly a fortnight. On the Friday before Palm-Sunday, Gardiner, the Bishop of Winchester, and nineteen others of the council, came from the Queen, and charged her with being privy to Wyat's conspiracy, alleging that she was concerned with the Carews, and other gentlemen in the west. The princess positively denied the accusation, and steadily asserted her innocence; but her visitors informed her that it was the Queen's will and pleasure that she should go to the Tower, while the matter underwent examination. Elizabeth was terrified at the idea of being sent to so "notorious and doleful a place;" she again asserted her innocence, and desired the councillors to intercede with her sister on her behalf. But they assured her that there was no remedy, and departed.

About an hour afterwards, the Lord Treasurer, the Bishop of Winchester, the Lord Steward, and the Earl of Sussex, entered with a guard, and removed all the servants of Elizabeth, substituting others of the Queen's; and there were stationed "an hundred of Northern soldiers in white coats, watching and warding about the garden all that night; a great fire being made in the midst of the hall, and two certain lords watching there also, with their band and company."

Upon Saturday following, (says Holinshed, that is on the next day,) two lords of the council, (the one was the Earl of Sussex, the other shall be nameless,) came and certified her grace that forthwith she must go unto the Tower, the barge being prepared for her, and the tide now ready which tarrieth for nobody. In heavy mood, her Grace requested the lords that she might tarry another tide, trusting that the next would be better and more comfortable. But one of the lords replied that neither tide nor time was to be delaied. And when her Grace requested that she might be suffered to write to the Queen's Majesty, he answered that he durst not permit that: adding, that in his judgment, it would rather hurt than profit her Grace in so doing. But the other lord, more courteous and favourable, (who was the Earl of Sussex,) kneeling down, said she should have liberty to write, and as a true man, he

would deliver it to the Queen's Highness, and bring an answer of the same whatsoever came thereof. Whereupon she wrote the following letter:—

To the Queen.

If any ever did try this olde saynge, that a kinge's worde was more than another man's othe, I most humbly beseche your Majesty to verefie it in me, and to remember your last promis and my last demande, that I be not condemned without answer and due profe; wiche it seems that now I am, for that without cause provid I am by your Counsel frome you commanded to go unto the Tower; a place more wonted for a false traitor than a true subject. Wiche, thogth I knowe I deserve it not, yet in the face of al this realme aperes that it is provid; wiche I pray God I may dy the shamefullist dethe that ever any died, afore I may mene any suche thinge: and to this present hower I protest afor God, (who shal juge my trueth whatsoever malice shal devis,) that I never practised, consiled, nor consented to any thinge that migth be prejudicial to your Person any way, or daungerous to the State by any mene. And therfor I humbly beseche your Majestie to let me answer afore your selfe, and not suffer me to trust to your Counselors; yea and that afore I go to the Tower, if it be possible; if not afore I be further condemned. Howbeit, I trust assuredly, your Highnes wyl give me leve to do it afor I go; for that thus shamfully I may not be cried out on as now I shal be; yea, and without cause. Let consciens move your Hithness to take some bettar way with me than to make me be condemned in al men's sigth afor my desert knowen. Also I most humbly beseche your Higthness to pardon this my boldnes, wiche innocency procures me to do togither with hope of your natural kindnes: wiche I trust wyl not se me cast away without desert; wiche what it is I wold desire no more of God but that you truly knewe. Wiche thinge I thinke and beleve you shal never by report knowe, unless by yourselfe you here. I have harde in my time of many cast away, for want of comminge to the presence of their Prince: and in late days I harde my Lorde of Sommerset say, that if his brother had bine sufferd to speke with him he had never sufferd; but the perswasions wer made to him so gret that he was brogth in belefe that he could not live safely if the Admiral lived; and that made him give his consent to his dethe. Thogth thes parsons are not to be compared to your Majestie, yet I pray God, as ivel perswations perswade not one sistar again the other; and al for that the have harde false report and not harkene to the trueth knowin. Therfor ons again kniling with humbleness of my hart, bicause I am not sufferd to bow the knees of my body, I humbly crave to speke with your Higthnis: wiche I wolde not be so bold to desier if I knewe not my self most clere as I knowe my selfe most tru. And as for the traitor Wiat, he migth paravantur writ me a lettar; but on my faithe I never receved any from him. And as for the copie of my lettar sent to the Frenche kinge, I pray God confounde me eternally if ever I sent him worde, message, token, or lettar by any menes; and to this my truith I will stande in to my dethe.

Your Highnes most faithful subject
that hathe bien from the begin-
ninge and wylbe to my ende,
ELIZABETH.

I humbly crave but only one
worde of answer from your selfe.

The princess was taken to the Tower on the following day. As that happened to be Palm Sunday, an order was issued throughout London, with the view of enabling her removal to be effected with more privacy, that every one should keep his church and carry his palm. Besides the two lords and the guards, there went with her three of the queen's gentlewomen, three of her own, her gentleman usher, and two grooms of her chamber. In passing London Bridge the whole party narrowly escaped with their lives, in consequence of the great fall of the water. On reaching the Tower the barge was directed to the dismal entrance, known by the name of the Traitor's Gate. Elizabeth felt strongly the indignity thus put upon her, and would have refused to land, but that one of the lords, whose name Holinshed has withheld, plainly told her that she should not choose. It rained at the time, and the same lord offered her his cloak, but, "putting it back with her hand with a good dash," she stepped forth, and as she set her foot upon the stair exclaimed, "Here landeth as true a subject, being a prisoner, as ever landed at these stairs, and before thee, O God, I speak it, having none other friend than thee."

On entering within the building, she expressed her surprise at finding the guards and warders drawn out in order; and being informed that it was the custom on the reception of prisoners, she desired that if it were so, for her cause they might be dismissed; "whereat the poor men kneeled down, and with one voice prayed God to preserve her, for which, on the next day they were all discharged." Proceeding a short distance she sat down on a stone and there rested herself. The lieutenant pressed her to rise out of the rain, but she answered, "Better sit here than in a worse place, for God knoweth whither you will bring me;" and turning to her gentleman usher, who was weeping, she rebuked him, saying, "You ought rather to comfort than dismay me, especially for that I know my truth to be such, that no man shall have cause to weep for my sake." She then arose and was conducted to her prison.

Elizabeth's imprisonment in the Tower was of the most rigorous description. After she had been for some time closely confined, permission was granted, through the intercession of Lord Chandos, the lieutenant of the Tower, for her to walk in the queen's lodgings, in the presence, however, of the constable, the lieutenant, and three of the queen's ladies, and on condition that the windows should be shut. She was then indulged with walking in the queen's garden, for the sake of fresh air, but the shutters of all the windows which looked towards the garden were ordered to be kept close.

About the end of May Elizabeth was removed from the Tower, under the command of Sir Henry Bedingfield and Lord Williams of Thame, to the royal manor or palace at Woodstock. "The xx daye of May," says an old chronicle, "my lady Elizabeth, the queene's sister, came out of the Tower, and toke her barge at the lower wharffe, and so to Richmond, and from thens unto Wyndsor, and so to Wodstoke." It was at Richmond that the princess rested the first night of her journey; she was there watched carefully by the soldiers, her own private attendants being prevented from having access to her. These measures of severity led the princess to suppose, that orders had been given to put her to death privately, when she called her servants together to take leave, she desired them to pray for her, "For this night," she added, "I think I must die." The servants broke into tears and lamentations, and the gentleman usher went down to the Lord Williams in the court, desiring him unfeignedly to show whether his lady and mistress that night were in danger of death, whereby himself and fellows might take such part as God would appoint. "Marry, God forbid," exclaimed Lord Williams, "that any such wickedness should be intended, which rather than it should be wrought, I and my men will die at her feet." On the second day she reached Windsor, where she was lodged in the dean's house, near St. George's Collegiate Chapel. She then passed to Lord Williams's seat at Ricot, in Oxfordshire, where she was "verie princelie entertained, both of knights and ladies."

On arriving at Woodstock Elizabeth was lodged in the gatehouse of the palace, in an apartment which remained complete in the early part of the last century, with its original arched roof of Irish oak, curiously carved, and painted blue, with sprinklings

of gold ornaments, and which to the last retained the name of its illustrious captive. Holinshed mentions three lines which the princess wrote with a diamond on the glass of her window:—

Much suspected by me,
Nothing proved can be,
Quoth ELIZABETH, prisoner.

The German, Hentzner, who travelled in England in 1598, has recorded a sonnet, written by her with a piece of charcoal on a window-shutter, to the following effect:—

O, Fortune! how thy restless wavering state,
Hath fraught with cares my troubled wit!
Witness this present prison, whither fate
Hath borne me, and the joys I quit.
Thou causedest the guilty to be loosed
From bands, wherewith are innocents enclosed;
Causing the guiltless to be strait reserved,
And freeing those that death had well deserved;
But by her envy can be nothing wrought,
So God send to my foes all they have thought.
A.D. MDLV. ELIZABETH, Prisoner.

In the Bodleian Library there is an English translation of St. Paul's Epistles, printed in the black letter, which the Princess Elizabeth used during her confinement at Woodstock; and on a blank leaf is the following paragraph, written with her own hand, and in the style characteristic of the age:—"I walke many times into the pleasant fieldes of the Holye Scriptures, where I plucke up the goodliesome herbs of sentences by pruning, eate them by reading, chawe them by musing, and laie them up at length in the hie seate of memorie by gathering them together; that so having tasted the sweetness I maye the lesse perceave the bitterness of this miserable life." The covers of this book are of black silk, and the princess had amused herself with curiously working, or embossing, various devices and Latin inscriptions in gold twist.

Elizabeth was strictly guarded during her stay at Woodstock, though she was sometimes allowed to walk in the gardens of the palace. In this situation it is "no marvell," to use the words of Holinshed, "if the hearing upon a time out of her garden at Woodstocke, a certain milkmaide singing pleasantlie, wished herself to be a milkmaide as she was, saying that her case was better and life merrier." A fire broke out during the princess's imprisonment in the room under her room; it was promptly extinguished, and seems to have been the result of accident.

At a very early period Woodstock was a royal residence, and as late as the reign of Charles the First, all our kings were in the habit of occasionally taking up their abode here. The palace, or manor-house, was besieged by the Parliamentarians in the grand rebellion; and after being stoutly defended for some time by an officer of great skill and devoted loyalty, it sustained much damage, and was surrendered by commissioners from the king. In 1649 commissioners were assembled here by order of the Rump Parliament, for the purpose of surveying the royal property. They made the king's bedchamber their kitchen, the council-hall they converted into a brewhouse, and in the dining-room they collected, for the use of their fires, logs sawn from a noble tree, which had long flourished in the park under the name of the *King's Oak*.

But their triumph was soon interrupted by circumstances which filled that credulous age with wonder, and afforded an apt subject of laughter to the era which succeeded. Frightful noises assailed their ears in the night; dreadful phantasms glided before their eyes; nor were their sight and hearing alone rendered subject to terrific visitations; many round blows were given; their bed-clothes were torn in fragments, and sundry noxious ingredients were discharged on their amazed foreheads. The populace dignified the nocturnal operator with the name of the *Just Devil of Woodstock*. It afterwards appeared that the whole was contrived by the ingenuity of an adroit and humourous royalist, named *Joe Collins*, who had procured the situation of secretary to the commissioners, for the purpose of imposing on their credulity. When the jest was discovered, Collins was styled the *Merry Devil of Woodstock*.

The furniture was soon afterwards sold, and the buildings portioned by Cromwell or his agents, among three persons. Two of these about 1652, pulled down their portions for the sake of the stone; the portion of the third, which consisted of the gate-house in which the Princess Elizabeth was imprisoned, and some adjoining ruinous buildings was left standing. At a subsequent period this gatehouse was converted into a dwelling, by John Lord Lovelace, who was captain of the band of pensioners to William the Third; and here that nobleman resided for many years. The adjoining ruins were standing sometime afterwards; and there were persons living towards the close of the last century, who could remember a noble porch and some walls of the hall, the walls and magnificent windows of the chapel, several turrets at proper distances, and who could trace out many of the apartments. While Blenheim palace was building, Sir John Vanbrugh laid out 2000*l.* in keeping up the ruins of Woodstock. But the Lord Treasurer Godolphin afterwards observing to Sarah the Duchess of Marlborough, that a pile of ruins in the front of so fine a seat was an unseemly object, all the old buildings, including the Princess Elizabeth's gatehouse, were entirely demolished and removed. Our engraving contains a view of the "Princess Elizabeth's Chamber," and its adjoining ruins, originally taken in 1714, a few years before their destruction.

CONNEXION BETWEEN THE SOUL AND BODY.

SCARCELY can I conceive even to myself, this union between my body and my soul. How is it that I bear upon me the stamp of the Divinity, and that at the same time I grovel in the dust? Is my body in health, it wars against me. Is it sick, I languish with it in sympathy. It is at once a companion that I love, and an enemy that I dread. It is a prison, that frightens me, a partner with whom I dwell. If I weaken it by excess, I become incapable of anything noble; if I indulge it, or treat it with too much consideration, it revolts, and my slave escapes me. It fastens me to the earth by ties I cannot break; and prevents me from taking my upward flight to God for which end alone I was created. It is an enemy that I love, a treacherous friend whom it is my duty to distrust. To fear and yet to love! At once what union and what discord! For what end, with what secret motive, is it that man has been thus organized? Is it not that God has seen it fit by this means to humble our pride, which may otherwise have carried us to the height of disdaining even our Creator, in the thought that being derived from the same fount of being, we might be permitted to regard ourselves as on terms of equality with Him? It is then to recall us incessantly to the sense of our entire dependence on him, that God has reduced our bodies to this state of frailty, which exposes it to perpetual combats; balancing our nobleness by our baseness; holding us in suspense between death and immortality, according to the affection which inclines us to the body or the soul; so that, if the excellences of our souls should inspire us with pride, the imperfections inseparable from our bodies may bring us back to humility.—St. GREGORY; *Book of the Fathers.*

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY.

No. XII.

THE EXODUS.

THE destruction of all the firstborn of Egypt was so fearful a visitation, that the wicked Pharaoh no longer dared to brave the rightful anger of the Omnipotent, and he gave a reluctant consent to the departure of the children of Israel. There are some circumstances in the account of the preparations which the chosen people made for their perilous journey requiring a brief comment, and we shall therefore make an extract from the sacred narrative.

And it came to pass, that at midnight the LORD smote all the firstborn in the land of Egypt, from the firstborn of Pharaoh that sat on his throne unto the firstborn of the captive that *was* in the dungeon; and all the firstborn of cattle. And Pharaoh rose up in the night, he, and all his servants, and all the Egyptians; and there was a great cry in Egypt; for *there was* not a house where *there was* not one dead. And he called for Moses and Aaron by night, and said, Rise up, *and* get you forth from among my people, both ye and the children of Israel; and go, serve the LORD, as ye have said. Also take your flocks and your herds, as ye have said, and be gone; and bless me also. And the Egyptians were urgent upon the people, that they might send them out of the land in haste; for they said, We *be* all dead *men*. And the people took their dough before it was leavened, their kneadingtroughs being bound up in their clothes upon their shoulders. And the children of Israel did according to the word of Moses; and they borrowed of the Egyptians jewels of silver, and jewels of gold, and raiment: And the LORD gave the people favour in the sight of the Egyptians, so that they lent unto them *such things as they required*. (Exodus xii. 29—36.)

In this passage we must first remark that the destruction of the firstborn took place at a time when the Egyptians were buried in sleep, for it appears from the monuments that they went early to repose, at least we can discover no representations of lamps or candles, nor are fragments of lamps among the articles of Egyptian pottery, discovered in the ruins of their cities in anything like the abundance in which they are found at Herculaneum and Pompeii. This must have added awfully to the terrors of the miracle, and it is no wonder that Pharaoh in the midst of darkness, desolation, and death, should have hurried away those whom he regarded as the source of so fearful a visitation.

It is mentioned that among the sufferers was "the firstborn of the captive in the dungeon;" although there is no distinct representation of a prison on any of the Egyptian monuments which have been yet discovered, there can be doubt that women and children shared the captivity of their husbands and fathers; we find them driven like herds of cattle to the slave-market, led as memorials of victory in triumphal processions, and forced to bear a part in the onerous labours imposed upon slaves. In the East at the present day, women and children continue subject to the calamities of war; in the revolutions of Persia, during the last century, many ladies of exalted rank might say in the sad words of the prophet, "They that did feed delicately are desolate in the streets: they that were brought up in scarlet embrace dunghills." (Lam. iv. 5.) There is no improbability therefore in the statement of the tenth plague having aggravated the miseries even of the prison-house, and swept away the firstborn of the captive, as well as the firstborn of the king. And as we have shown in preceding sections of this series, that the reigning Pharaoh was most probably a foreign intruder, it is not difficult to believe that the amount of captives in the Egyptian dungeons must have been very considerable.

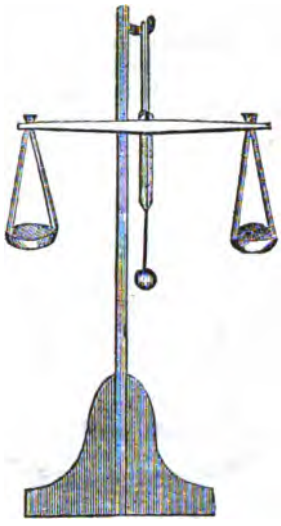
So great was the anxiety of the Egyptians to get rid of the Israelites, that they would not permit them to bake their provisions, but compelled them to take the dough in their kneadingtroughs. We have shown in a former section, that baked meats and confectionary constituted the greater part of the food of the Egyptian people, and consequently the kneadingtrough was an important article of furniture. It was probably made of metal, like that depicted in the accompanying engraving, and could be applied to a variety of useful purposes. In the present instance

CONFECTIONERS PREPARING SWEETMEATS.

the two figures are engaged in the manufacture of piped sweetmeats, not unlike maccaroni both in shape and consistency, which is at the present day a favourite luxury with the natives of Hindústan. It seems probable that the preparation of these and similar sweetmeats, was one of the tasks imposed upon the Hebrews during their bondage in Egypt; for we learn from the book of Samuel, that the preparation of these confections was looked upon as a degrading toil, and among the evils which the prophet predicts to the people from their determination to elect a king, we find this circumstance put very prominently forward. "And he will take your daughters to be confectionaries, and to be cooks, and to be bakers." (1 Sam. viii. 13.)

Our translation states that the Hebrews *borrowed* jewels of silver, and jewels of gold, from the Egyptians, by the direction of Moses, and thus seems to cast an imputation of dishonesty on the transaction which is far from being warranted by the original text. In the first place, the verb *shaal* signifies not *to borrow*, but *to demand*, and secondly, the word *kelím* signifies not *jewels*, but *vessels* or *implements*. The plain meaning of the passage then is, that the Israelites demanded payment of the wages due to them for their labours, and as these were considerable, the amount paid must have exhausted the immediate resources of the Egyptians. There is nothing that more excites astonishment in viewing the monuments, than the vast amount of gold and silver plate displayed on the sideboards and in the palaces of the Egyptians, and it is not improbable that before the use of coinage became common, such vases were sometimes employed as a medium of exchange. But the monuments suggest to us another meaning of the word *kelím*; they show us that the Egyptians in the early ages used ring-money, that is, bullion made up in the shape of annulets like the bangles worn by the Hindús, which are frequently used for money in India. Indeed, in consequence of bullion circulating in this shape, we find that balances were erected for weighing money, and assay-masters appointed to determine the purity of the vessel in all the principal market-places. And this custom prevailed in

Judea so late as the time of the prophet Jeremiah, for we find him recording the circumstances of a remarkable bargain and sale.



ANCIENT EGYPTIAN BALANCE.

Hanameel, mine uncle's son, came to me in the court of the prison, according to the word of the Lord, and said unto me, Buy my field, I pray thee, that is in Anathoth, which is in the country of Benjamin: for the right of inheritance is thine, and the redemption is thine; buy it for thyself. Then I knew that this was the work of the Lord. And I bought the field of Hanameel my uncle's son, that was in Anathoth, and weighed him the money, even seventeen shekels of silver. And I subscribed the evidence, and sealed it, and took witnesses, and weighed him the money in the balances. (Jeremiah xxxii. 8—10.

Bangles, or ring-money, are still employed as a medium of exchange in India and the interior of Africa; very little attention is paid to the beauty of their manufacture, and hence they might well be called *kelim* by the sacred historians, for that word is properly applied to articles coarsely made for ordinary use, but never, we believe, to anything like ornamental work. It appears from what we have said, that the transaction which has so often furnished materials for revilings and objections, to those who "sit in the seat of the scornful," was a mere act of equity, a demand of what was justly due.

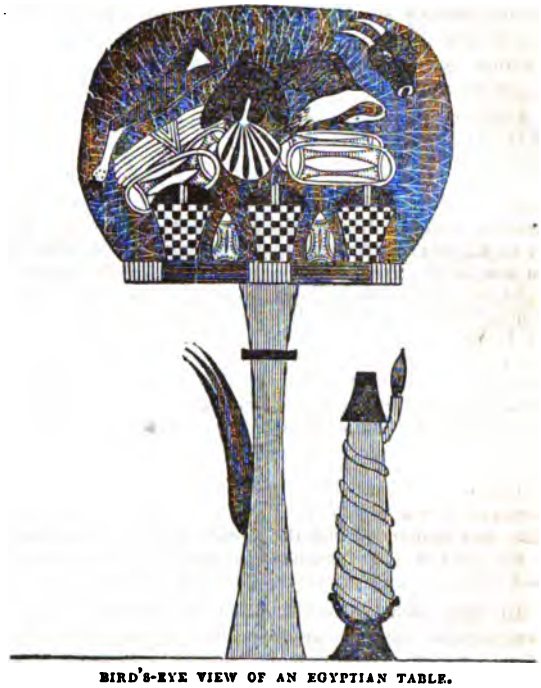
The passover was strictly a Hebrew institution, and we cannot expect to find any illustration of it, save very indirectly on the Egyptian monuments; we may, however, see that the directions given respecting the manner in which it was to be eaten, are directly the reverse of the habits which were adopted at meals in the valley of the Nile.

And thus shall ye eat it; with your loins girded, your shoes on your feet, and your staff in your hand; and ye shall eat it in haste: it is the Lord's passover. (Ex. xii. 11.)

The Egyptians were particularly formal at their dinners, which always commenced at noon, and a great variety of viands were displayed at their tables. So very formal were they at these entertainments, that we find dresses provided for the guests, a custom which had not fallen into disuse so late as the coming of Christ, as we learn from the parable of the marriage of the king's son.

And when the king came in to see the guests, he saw there a man which had not on a wedding garment: And he said unto him, Friend, how camest thou in hither not having a wedding garment? And he was speechless. Then said the king to the servants, Bind him hand and foot, and take him away. (Matt. xxii. 11—13.)

There was no excuse for the disrespect shown, as proper vestments were provided by the giver of the feast. But all the circumstances attending the eating of the Paschal Lamb, were designed to mark urgency and haste. Instead of being divided into joints, and served up with variety of cookery, it was to be roasted whole; its only accompaniment was to be bitter herbs, for it was not an entertainment of luxury, but an acknowledgment of deliverance from the most cruel servitude recorded in the annals of history.



BIRD'S-EYE VIEW OF AN EGYPTIAN TABLE.

The next circumstance to which our attention is directed, is the course pursued by the Israelites after their departure from Egypt.

And it came to pass, when Pharaoh had let the people go, that God led them not through the way of the land of the Philistines, although that was near; for God said, Lest peradventure the people repent when they see war, and they return to Egypt: But God led the people about, through the way of the wilderness of the Red Sea; and the children of Israel went up harnessed out of the land of Egypt. And Moses took the bones of Joseph with him: for he had straitly sworn the children of Israel, saying, God will surely visit you; and ye shall carry up my bones away hence with you. (Gen. xiii. 19.)

The Philistines appear to have been a people of the same race as the Hyksos, by whose ravages we have already shown that the Egyptians were very severely harassed. During the period of their bondage, the Israelites had not been permitted to learn the use of weapons, they were, therefore, likely to be daunted if immediately brought into collision with the most warlike nation of antiquity. It was necessary that they should undergo a long course of preparation by their wanderings in the desert, that they might learn confidence in themselves and in their God.

Joseph's anxiety to have his bones buried in the sepulchre of his fathers, is a feeling common in most nations, but it was one likely to be greatly strengthened by a residence in Egypt, where kings looked upon their tombs as of greater importance than their palaces. We find from the monuments, that the Egyptians had family cemeteries, and that it was considered a great disgrace to be excluded from them; and to ensure that none but the worthy should be admitted there was a solemn judgment of the dead, through which ordeal even the king's corpse should pass before it received interment.

RUSSIA. No. VIII.

CEREMONIES OF THE GRECO-RUSSIAN CHURCH.

FUNERAL RITES AND CEREMONIES.

THE calm sublimity, the deep and tender pathos, the chastened hopes, that pervade the beautiful and purely spiritual service of *our* national church, must have been deeply felt by all who have once followed to their long home the mortal remains of one beloved: and who is there that has not done so? and who is there, though he may have bent over the grave with tears, that has not quitted it with hope, for the time "a wiser and a better man," beneath the influence of its soothing promises? Far from repressing the tenderest emotions of our nature, it encourages, whilst it regulates, ennobles, and sanctifies them.

The whole of the Greco-Russian church-service for the burial of the dead is highly impressive, but at the same time much too exciting. They have a singular form, peculiar to themselves, of making known the death of a person. The individual sent round to the friends and relatives to convey the tidings, would, supposing the name of the deceased to be John, and that of his father James, announce it thus:—*Ivan Jakovitch vam jclaët dolgo jcet*;—"John, the son of James, wishes you to live long," adding generally the family name of the individual.

The last struggle over, and the filmed eye closed by the hand of the nearest relative, the body, having first been washed, in accordance with the practice of ancient and modern times, is habited in its ordinary apparel, as is the practice of most countries on the Continent. The hands are crossed on the breast, and above them is laid a picture of the patron saint. If the individual had been in the service of the crown, the corpse is generally arrayed in full dress uniform. The priest is then summoned: after fumigating the apartment with incense, and blessing it by the aspersion of holy water, he reads a short formula: a few verses are then sung by the attendant choir, in a low impressive tone, and the service is then concluded with prayers for the soul of the deceased. It is generally the practice among the wealthier classes to retain a deacon or other inferior member of the ecclesiastical body, to read night and day selections from the Gospel, whilst the body remains in the house: this, however, is not ordained by the church.

Receiving intimation of the event, in the terms we have mentioned, the friends and relatives of the deceased throng to the house of death, to offer their condolence. The custom of paying a visit of this kind in mourning is not observed in Russia: indeed on entering the saloon the assemblage might almost be mistaken for one gathered on some ordinary occasion. The sombre attire, the quiet subdued tone of manners, the suppressed voice, the noiseless tread, are wanting. The rustling of silks, the jingling of spurs, the unstifled laugh, the elevated tone of voice, are little in harmony with the solemnity of the occasion. The wreaths of fragrant incense that curl through the opened door of the adjoining room, the monotonous sound of the reader's voice as he recites the Gospels in low and hurried tones, the sob of the bereaved, heard perhaps at intervals of silence, alone tell that the hand of the spoiler has been there.

By turns the visitors are introduced into the apartment, where the body lies in state. The coffin, placed upon a trestle covered with crimson embroidered velvet, differs altogether in shape and ornament from those used in England, rather resembling the ancient sarcophagi, but accommodated in length to the human figure. It also stands in the same way upon four claws: these are generally plated or gilt The covering is of crimson or pink velvet, or cloth, frequently sumptuously fringed with gold or silver: the lining is of white satin, and the head of the deceased rests upon a pillow of the same material. At the head and also at the feet are placed two enormous wax tapers, in massy silver or plated tripods. There formerly existed a practice of hiring mourners, or persons whose sole occupation it was to attend upon funerals,

To feign a woe they could not feel.

This repulsive custom, although not extinct, is nevertheless banished from the capitals, excepting among the more ignorant classes. The writer of this article has witnessed it repeatedly in the provinces, and once or twice in the ancient metropolis of Russia. Not only unauthorized by, but utterly at variance with, the form prescribed by the Greek church, it has in all probability been adopted in imitation of the customs of the Jews and Romans, among the latter of whom, as with the Russians, only women, called *præficæ*, were employed.

According to the laws of Russia, the body must be deposited in the church, there to remain until the final ceremonies, which are as follows:—

The streets from the house to the church, and thence to the cemetery, through which the hearse passes, are strewed with sprigs of the aromatic juniper. First come ten or twelve torch-bearers, in long black cloaks, the collars and narrow capes of which are bound with white, and wearing round hats with enormous brims, eight or nine inches in width, that hang upon the shoulders and back, and flap over the face. Each bears a flambeau of resinous gum. As the interments invariably take place in the morning, in the full blaze of day, the effect is most absurd. Although the funerals of private individuals were always performed by torch-light and at night, yet the Romans it is well known celebrate all public obsequies in the forenoon; and it is generally imagined, from a passage in Plutarch, also with torches. From thence, in all probability, the custom has descended through the early Greek missionaries in the first ages of Christianity; at any rate, the high antiquity of the practice is unquestionable. Next come the clergy habited in their sacerdotal robes, usually, on these occasions, of black velvet, embroidered with silver, the priests bearing tapers, the deacons censors with incense, and repeating at intervals, in recitative, short prayers for the repose of the soul of the deceased, the responses and the chorus to which are chanted by the choir which follows next in succession. Should the deceased have obtained any marks of distinction in the service, the badges of his orders, and the insignia of his office, are borne before the hearse on cushions of crimson velvet, carried by persons as nearly as may be of his own rank; a custom decidedly of classic origin. To these succeeds the corpse, the coffin exposed to view on an open hearse, and supported by servants attired in mourning. In some cases the lid is carried before, the body being covered as far as the chest by a rich pall of coloured velvet, gorgeously embroidered. In the obsequies of persons of rank or wealth, a canopy of crimson velvet, fringed with gold lacings, is placed over the coffin. Then follow the mourners and friends in carriages, whilst the slaves and supernumerary servants on foot, flank and terminate the procession.

After a brief halt in the narthex of the church when the lid, if it have remained on, is removed, the coffin is borne into the nave, and deposited on a bier of embroidered velvet, before the steps of the chancel. Large wax tapers are placed round it, and each of the attendant friends is also furnished with one of smaller size. These kindled, and the choristers sta-

tioned at each end of the chancel, the service begins with the 91st Psalm, which is sung in an under voice; afterwards follows the 119th Psalm, chanted in louder tones. At the end of each verse the Hallelujah Chorus is sung by the whole choir, invocations to the Virgin, and prayers for the dead, are then offered up, accompanied by the chanted response of the choristers. Among the hymns sung on the occasion is the following, attributed to Joannas Damascenas. At the conclusion of the prayers, the priest and deacons descend from the altar, and walking three times round the bier, perfuming with their censors and sprinkling the by-standers with holy water, then stationing themselves around, a solemn and affecting farewell hymn is sung, and the mourning friends hasten to pay their last honours and give the parting kiss; this is termed the *Aspasmos*, or last embrace.

Draw near, my brethren! ascribing glory to God, let us give our last kiss, and bid our last farewell, to our departed brother; engrossed no longer by the vanities or the cares of the world, he hath forsaken his kindred, and approacheth the tomb. His kindred and his friends where are they? Behold we are separated. May the Lord grant unto him repose!

But what a separation my brethren! what lamentation and woe attend this mournful hour! Draw near! Embrace him who was lately one of yourselves. He is abandoned to the grave, he sojourneth in darkness and must moulder with the dead. Now is he cut off from his kindred and his friends. May the Lord grant unto him repose!

Every unholy connexion with life and its vanities is dissolved. The spirit hath left its tenement, the clay is disfigured, the vessel broken. We bear a motionless, speechless, senseless carcase to the tomb. May the Lord grant unto him repose!

What is life? a blossom, a vapour, the light dew of morning. Come near, then, let us attentively contemplate the grave! Where now the graceful form? Where the sparkling of the eye, the beauty of the cheek? all, all, withered like the grass, have vanished from our eyes. Come, let us prostrate ourselves with tears, before Christ our Saviour.

What lamentation and woe, what tears and agonies when the soul is torn from the body! Hades and the bottomless pit yawn around. Life is a fleeting shadow, a dream of error, the fruitless toil of transitory being.

Fly then the contaminations of the world, that ye may lay hold of the kingdom of heaven. Let us approach, my brethren! and view the dust and ashes of which we are formed. Whither are we bound? What shall be our destiny? Who is poor, who is rich? Who is master? Who is slave? All, all, are but ashes. The glory of man passeth away: the flower of youth is plucked by death.

See the limbs now motionless which were lately strung with vigour. Lo! now they are powerless, the eyes are closed; the feet fast bound; the hands at rest; the ears have ceased from their office; the tongue hath no utterance. All are given up to the grave, behold all things terrestrial are vanity.

The scene is impressive, but everything around too strongly tends to arouse the imagination, and stimulate the feelings to a pitch of unnatural excitement, incompatible with the solemn and holy thoughts which should occupy the mind at such a moment.

Even to the casual stranger the excitation is irresistibly powerful, "he catches the trick of grief," and shares in the sorrow of the mourners, as he sees friend after friend with grief swollen cheek and streaming eyes, ascend the steps of the platform, falter out the valedictory prayer, and imprint the parting kiss on the lips and brow of the dead.

The last embrace given, and the farewell hymn sung, the procession resumes its way, in the same order, to the cemetery, where no further ceremonial is observed, excepting that the officiating priest casts first a little earth, in the form of a cross, into the vault, upon a coffin, and then pours upon it some holy oil, pronouncing the words, "The earth is the Lord's and the fulness thereof, the round world and they that dwell therein." He then dismisses the assembly with the doxology and benediction.

Services are performed, and the absolution and remission read at the church, or at the grave, on the third, ninth, and fortieth day, on the birthday, and on the anniversary of the demise of the individual. The two last are continued for an indefinite length of time. These services are not ordained by the rubric of the church, but have been sanctioned by long usage, and adopted from the practice of the primitive oriental Greek church, which practice is itself clearly deducible from the *Paternalia* of the ancients.

It is worthy of remark, that the Mussulmans observe also the third, ninth, and fortieth days, and provide feasts upon the occasion, as is done in Russia. The service on the third day is called the *Tretinui*, that on the ninth the *Devatinui*; the popular belief is, that the soul of the deceased has not, till this period, or till the expiration of the fortieth day, wholly shaken off the trammels of earth. This service has a parallel in the *Novendiale* of the Romans, a solemnity grounded upon the same superstition. Another practice, evidently of high antiquity, prevails throughout the country and amongst all classes. During the celebration of the service, a dish called the *Kootiyah* composed of rice, dressed with honey, to which raisins are sometimes added, is placed near the coffin; after the burial, each of the guests invited to the feast, usually prepared on such occasions, takes three spoonfuls of the *Kootiyah*, and repeats a short ejaculating prayer for the repose of the deceased's soul.

On the fortieth day prayers are again said, and a service performed, called the *Sorotchénui*, after which the priests, with the friends, are assembled to dinner, and commence by partaking of the "Kootiyah," accompanied with the usual prayer for the dead. Sometimes a daily service is performed till the expiration of the forty days: this is termed the *Corokoustiè*. It would be idle to record the numberless silly popular superstitions as to the origin of these ceremonies, that are prevalent, not only among the lower classes, but even amongst those who from rank and education might be expected to know better. From the prevailing imagination that the souls of the deceased hovered about the graves, it is well known that the ancient heathens were in the habit of preparing a feast for the dead and the living called the *Silicernium*, and that a portion of this was deposited on the tomb or within the temple. The fondness with which some of the early converts clung to these practices of their forefathers, blending them with the pure rites of their newly adopted worship, and the eagerness with which their steps were followed in succeeding ages, by the indiscriminating zeal of those who had not the same blinding associations of kindred and of country, will sufficiently account for the transmission of these customs to later ages and more enlightened times, although unsanctioned by the authority of the church, and in direct opposition to the simple character of its ritual.

Another coincidence is not unworthy of remark: the term *Bustirupus*, (the robber of the pyre,) was among the Romans one of the deepest execration and contempt. The Russians have a corresponding expression *Kootyanik*, a word signifying the "stealer of Kootiyah," one of the most opprobrious epithets that can be applied to the vilest criminal.

The will of the deceased is read, and his papers are examined on the fortieth day, when the seal placed on his property by the police is removed by the proper authorities.

THE DUTCH FISHERIES.

No. II.

COD FISHERY.

THE Dutch Cod fishery is of less importance than the Herring. Those vessels which during November have been employed in the latter, are repaired and graved, so as to be in a condition for putting out to sea for the former on the 6th of December, that being St. Nicholas' day. No positive obligation attaches to that day, for the government-bounty regulations only require their going to sea before the first of January. The bounty amounts to three hundred florins, or about twenty-four pounds sterling.

Far fewer vessels are employed in the Cod fishery. Vlaardingen generally sends out about forty, but of all the other towns already mentioned, one other only, Maasluis, sends any.

The Winter Cod fishing is called *Beug vaart*, from the *beug* employed in it. This consists of a rope half a league in length, or more, with bouys at certain distances to keep it near the surface of the water, and armed throughout its whole length with lines and hooks, the hooks being baited with lampreys, or, if these cannot be had, with *geep*. As lampreys make the best bait, no pains are spared in getting them. A vessel with a reservoir for preserving them is sent before the fishing commences to England for a supply, the rivers there being better stored with them than those of Holland are. Each fisherman takes what he requires, and the remainder is deposited in a reservoir at Vlaardingen to serve for future voyages.

Previous to the flotilla's putting out to sea, there is appointed what is called the *Dank-segging-tag voor de schepens*, that is, *Thanks-saying-day for the ships*. Thanks are offered on the occasion for the expedition that is over, and prayers made for that which is to commence.

The vessels are not long at sea, returning generally with fresh and salted cod, within five weeks from their departure. The fish are all caught in the North Sea, and the season closes in March. In April the mode of capture is changed, and with it the term applied to the fishery. Lines are then employed; the fishery is called *kolreis*; and it closes in May, when the vessels return in order to prepare for the herring fishery. No fresh cod is brought home from the *kolreis*, the cod at that season being too fat and oily.

A third Cod fishing is prosecuted by the Dutch, which is called *Islandsche vaart*, from being carried on along the coast of Iceland. The vessels set out in May, and return to Holland in August or September. Though often lucrative, it is difficult and dangerous, from the coldness of the climate, and the storms encountered on the Iceland coast. The vessels employed, not above twenty-five in number, are brigs, and are all sent out by the villages on the left bank of the Maas. The cod fish they bring home is of excellent quality, and is known by the softness and delicacy of its skin, and the whiteness of the fibre when cooked.

The Whale fishery in Holland is called the Little fishery, to distinguish it from that of Herring and Cod, or the Great fishery. The Whale fishery was very considerable in former times, and was chiefly confined to Rotterdam adventurers. Large three-masted vessels were employed with numerous crews. They sailed either for the South Seas or for the coast of Greenland, and were often called *Groenlande-vaarders*.

This branch of industry used to be so much encouraged that even the public treasury bore the expense of some of the expeditions fitted out. But the same causes which injured the Dutch by reducing their once flourishing Herring fishery, affected that for Whales also. Successive wars prevented the vessels from putting to sea, and the government preferred employing them and their crews in the defence of the country. Five years ago the whaling vessels which then remained were wrecked, and almost all the harpooners perished; but the government is doing everything in its power to repair this last calamity and to revive the Whale fishery, now successfully prosecuted by the French. Among other things it is forming harpooners at its own expense.

THE PLANETARY SYSTEM.

FAIR star of Eve, thy lucid ray
Directs my thoughts to realms on high;
Great is the theme, (though weak the lay,)
For my heart whispers *God is nigh*.

The Sun, vicegerent of his power,
Shall rend the veil of parting night,
Salute the spheres, at early hour,
And pour a flood of life and light.

Seven circling planets I behold,
Their diff'rent orbits all describe;
Copernicus these wonders told,
And bade the laws of truth revive.

Mercury and *Venus* first appear,
Nearest the dazzling source of day,
Three months compose *his* hasty year,
In seven *she* treads the heavenly way.

Next *Earth* completes her yearly course,
The Moon, as satellite, attends;
Attraction is the hidden force,
On which creation's law depends.

Then *Mars* is seen of fiery hue;
Jupiter's orb we next descry;
His atmospheric belts we view
And four bright moons attract the eye.

Mars soon his revolution makes,
In twice twelve months the Sun surrounds;
Jupiter greater limit takes
And twelve long years declare his bounds.

With ring of light see *Saturn* slow,
Pursue his path in endless space;
By seven pale moons his course we know,
And thirty years that round shall trace.

The *Georgium Sidus* next appears,
By his amazing distance known;
The lapse of more than eighty years,
In his account makes *one alone*.

Six moons are *his* by Herschel shown,
Herschel, of modern times the boast:
Discovery here is all his own,
Another planetary host!

And lo! by astronomic scan,
Three stranger *planets* track the skies,
Part of that high majestic plan,
Whence those successive worlds arise.

Next Mars, *Piazzi's* orb is seen,
Four years, six months, complete his round:
Science shall, renovated, beam,
And gild Palermo's favoured ground.

Daughters of telescopic ray—
Pallas and *Juno*, smaller spheres,
Are seen near Jove's imperial day,
Tracing the heavens in destined years.

Comets and fixed stars I see,
With native lustre ever shine;
How great, how good, how dreadful HE,
In whom life, light, and truth combine!

Oh may I better know his will,
And more implicitly obey;
Be God my friend, my father still,
From finite—to eternal day.—MANGNALL.

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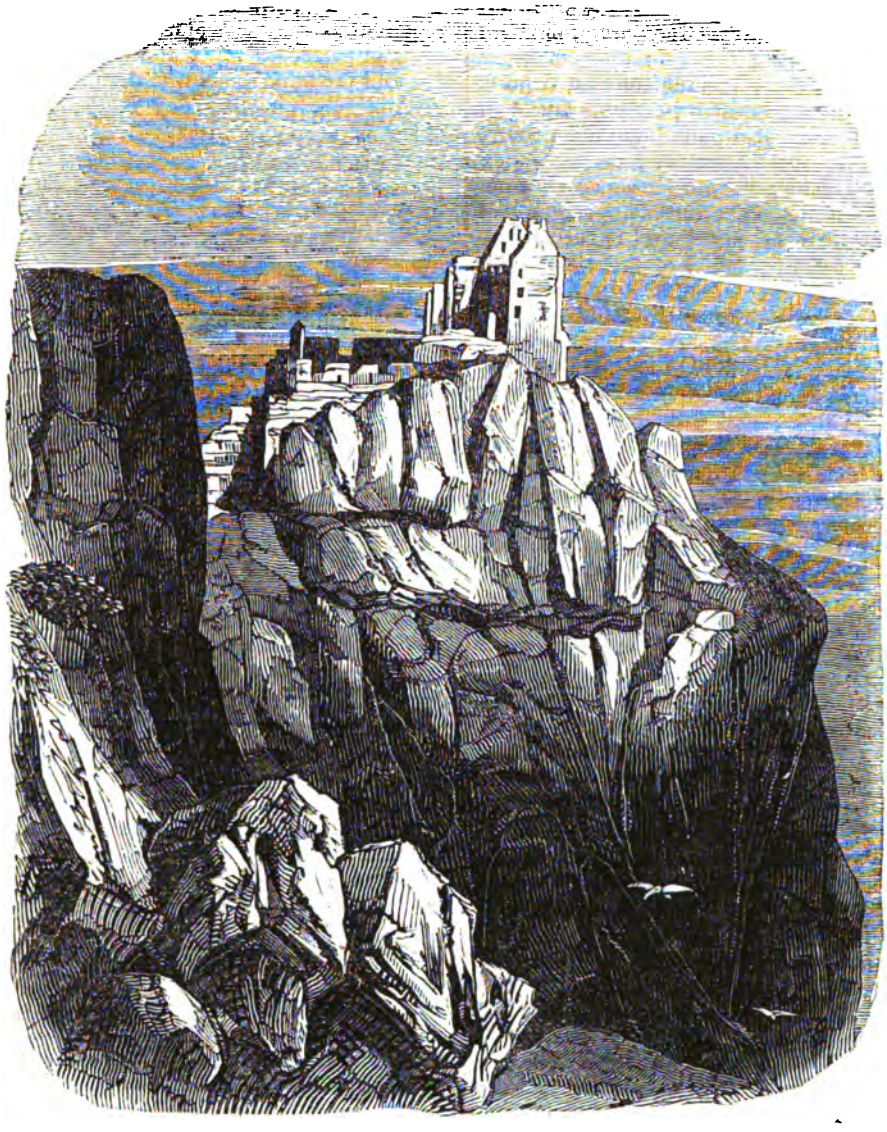
THE ALBIGENSES. No. V.



THE CASTLE OF CRUSSOL, IN THE SOUTH OF FRANCE.

CRUSADE AGAINST THE ALBIGENSES UNDER SIMON DE MONTFORT—CRUELTIES PRACTISED UPON THE INHABITANTS OF THE CAPTURED CASTLES—SIEGE OF LAVAUR.

THE Castle of Crussol, situated in the ancient district of Vivarais, and in that part of it which forms the modern department of Ardèche, is one of the most picturesque of those ruined strong-holds so numerous in the south of France, and so interesting in the eyes of a Protestant, from their connexion with the memorable crusade carried on against the Albigenses, by the Church of Rome and its adherents, in the early part of the thirteenth century. It stands upon a lofty eminence of rock, not far from the right bank of the river Rhone, and nearly opposite to the town of Valence, upon the left bank.

It stands, (says Mr. Hughes,) on a conical cliff on the opposite side of the river, overlooking the town at about two cannon-shots' distance. On inquiring into the history of this eagle's-nest, we found that it had been, in days of yore, the fastness of a petty free-booting chief, who kept the inhabitants of Valence in a perpetual state of war and annoyance; a history which almost appears fabricated to suit its appearance and character. Seeing it relieved by a gleam of sunshine from a dark evening cloud behind it, we could fancy, without any great effort of imagination, that, like the bed-ridden Giant Pope in honest John Bunyan, it was grinning a ghastly smile of envy at the prosperity which it could no longer interrupt.

In a former paper* we brought down the history of the crusade against the Albigenses to the capture of the castle of Minerve, by Simon de Montfort, in the month of July, 1210, when that ambitious per-

* See *Saturday Magazine*, Vol. XII., p. 89.

secuting chieftain and his fanatical followers, compelled one hundred and forty persons, men and women, to leap into the flames, which they had kindled in the square of the castle. Immediately after, De Montfort proceeded to the siege of the castle of Termes, an extremely strong fortress upon the frontiers of Roussillon.

The capture of Minerve and Termes, two of the strongest places in Languedoc, produced a very disheartening effect upon the garrisons of other castles, who feared to put any trust in the strength of their walls against the overwhelming force of the crusaders. As De Montfort advanced from Termes to the northward, he found a large number of their fortresses deserted; the inhabitants had abandoned them in despair, and betaken themselves for security to the woods and mountains. But their flight did not save them from the unrelenting ferocity of their enemies; they were pursued into their retreats, where the greater part of them were put to the sword, the rest being taken captive to the camp, and burned for the edification of the army.

The prospect of a great addition to the army of crusaders in the ensuing campaign of 1211, inspired their leader with fresh confidence and boldness. The fervid zeal of the monks, loath to slumber in the cause of persecution, had never ceased to inflame the passions of the credulous vulgar; and the success which had attended their recent preachings, gave promise of a larger crowd of fanatical pilgrims than had visited the country of the Albigenses in either of the preceding years. De Montfort felt that it was no longer necessary for him to keep any measures, or, in the phrase of Pope Innocent, "to employ guile" with regard to the Count of Toulouse; and he prepared, therefore, to commence open hostilities against him. He was prompted to this step by a desire of gratifying not only his own ambition in adding the fine sovereignty of Count Raymond to his former acquisitions, but likewise the hatred which the abbot Arnold, and Fouquet, the persecuting bishop of Toulouse, had contracted for that unfortunate prince.

In the month of March, Simon de Montfort, finding himself at the head of a very large army, proceeded to open the campaign, and directed his first effort against the castle of Cabaret. This stronghold had hitherto successfully resisted the arms of the crusaders; but it appears that the continual reverses of the Albigenses during the two years of the war, had broken their spirit and deprived them of the hope of effectually contending with the overwhelming force which avarice and fanaticism had arrayed against them. For Peter Roger, the lord of Cabaret, opened his gates on the approach of De Montfort, and tendered his voluntary submission; and his example was followed by the chiefs of many other castles situated in the mountains, which separate the dioceses of Carcassonne and Toulouse. All these places on surrendering were treated with humanity; De Montfort rarely exercised this virtue, and this departure from his general practice is accounted for by his desire of obviating the delay which would have been occasioned to his progress, if he had driven their defenders to a desperate resistance, by showing them that they would be no better treated if they surrendered.

Lavaur, situated on the Agout at the distance of five miles from Toulouse, became now the object of attack. This place, which afterwards rose to be an episcopal city, was then only a strong castle, belonging to a widow named Guirande, whom her brother, Aimery de Montreal, had joined with eighty knights, after having been deprived of his own possessions by the crusaders. Both the noble lady and her brother professed the doctrines of the Albigenses; and they had opened an asylum within the walls of the castle, for those who were persecuted in other parts of the province. Lavaur was thus regarded by the crusaders as one of the principal seats of heresy; and as the fortress was surrounded by strong walls and protected by deep ditches, besides being well stored with provisions, its capture was deemed an object of great importance.

While the crusaders were undertaking the siege of Lavaur, Fouquet, the fanatical bishop of Toulouse, repaired to that city and displayed his zeal in the cause of persecution by gathering a band of auxiliaries. He told the inhabitants that the presence of a number of Albigenses in that city had rendered them an object of horror to all Christians; and that to purify themselves from the stigma of being confounded with those heretics, they should exhibit an exceeding zeal in arming themselves against those of their fellow-citizens who had departed from the Catholic Church. He succeeded in enrolling a large number of them in a society which styled itself the "White Company," and in token of the purity of its faith engaged to destroy the heretics by fire and sword. Five thousand of this body of fanatics he despatched to aid in the siege of Lavaur.

This siege was prosecuted by the crusaders with vigour. Their chieftain possessed a large share of military skill; and his experience had made him conversant with all the resources of the art of war in that age. He himself had served in the Holy Land; and he had in his camp many knights who had fought against the Mohammedans and against the Greeks, and in their eastern campaigns had acquired a knowledge of the attack and defence of fortified places. He was therefore able to employ against the walls of Lavaur ingenious machines, which had been but recently introduced among the nations of the west, and were as yet quite unknown to the inhabitants of the country bordering upon the Pyrenees. The most fearful of these was that called the "cat." It was a very strong movable wooden tower, which being built out of the reach of the besieged, was entirely covered with sheep's-skins, with the fur outwards to guard it from fire, and then being provided with soldiers at its openings, and on the platform at its summit, was moved on rollers to the foot of the wall. Its side then opened, and an immense beam, armed with iron hooks, projected like the paw of a cat, shook the wall by reiterated strokes, after the manner of the ancient battering ram, and tore out, and pulled down, the stones which it had loosened.

De Montfort succeeded in constructing a "cat," but the wide ditches of Lavaur prevented him from bringing it near enough to the walls. The crusaders, under the order of De Montfort, laboured unceasingly to fill up the ditch, whilst the inhabitants of Lavaur, who could descend into it by subterraneous passages, cleared away in the night time all that had been thrown in during the day. At last Montfort succeeded in filling the mines with flame and smoke, and thereby prevented the inhabitants from passing into them. The ditches were then speedily filled, the cat was pushed to the foot of the wall; and its terrible paw began to open and enlarge the breach.

On the third of May, 1211, De Montfort judged the breach to be practicable, and the crusaders prepared for the assault.

The bishops, the abbot of Courdieu, who exercised the functions of vice-legate, and all the priests clothed in their pontifical habits, giving themselves up to the joy of seeing the carnage begin sang the hymn *Veni Creator*. The

knights mounted the breach; resistance was impossible, and the only care of Simon de Montfort was to prevent the crusaders from instantly falling upon the inhabitants, and to beseech them rather to make prisoners, that the priests of the living God might not be deprived of their promised joys. "Very soon," continues the monk of Vaux-Cernay, "they dragged out of the castle, Aimery Lord of Montreal, and other knights, to the number of eighty, whom the noble earl immediately ordered to be hanged upon the gallows; but as soon as Aimery, the stoutest among them, was hanged, the gallows fell; for, in their great haste, they had not well fixed it in the earth. The earl seeing this would produce great delay, ordered the rest to be massacred; and the pilgrims, receiving the order with the greatest avidity, very soon massacred them all upon the spot. The lady of the castle, who was sister of Aimery, and an execrable heretic, was by the count's order thrown into a pit, which was filled up with stones; afterwards our pilgrims collected the innumerable heretics that the castle contained, and burned them alive with very great joy."

The expression of "very great joy" used by the writer whom Sismondi here quotes, is the phrase which he always employs upon a similar occasion. The writer is Peter de Vaux Cernay, a monk of Citeaux, who followed his lord Simon de Montfort to the crusade, and was doubtless an eye-witness of the enormities which he relates, and in the relation of which he seems to take as much delight as he ascribes to the actors in the perpetration of them.

ON ARTIFICIAL PEARLS.

Among those decorations, which have at all times obtained a large share of admiration, may be reckoned Pearls. The delicate hue of these little globules has made them a very favourite ornament in nearly every part of the earth, especially in the East, where personal decoration is carried to a much greater extent than in most European nations. It is evident, from different allusions in the Old Testament, that Pearls were looked upon, several centuries before the Christian era, as the same costly and precious gems that they are in the present day. We will instance one from the Book of Job, chap. xxviii. v. 17; speaking of wisdom, Job says, "The gold and the crystal cannot equal it: and the exchange of it shall not be for jewels of fine gold. No mention shall be made of coral, or of *pearls:* for the price of wisdom is above rubies." The readers of Roman history are familiar with the story of Cleopatra, Queen of Egypt, who, as it is said, dissolved in vinegar a pearl, valued at 50,000*l.*, and drank it off. This silly exhibition of extravagance sufficiently shows what an enormous value was placed upon Pearls in those days; and we can scarcely wonder that attempts should have been made, at a very early period, to produce something that should present a similarity to Pearls.

We have already given a description of the Pearl Fishery in Ceylon*, so that we need not describe, at any length in this place, the mode of procuring natural Pearls, except so far as we have anything new to say upon the subject. Some of our readers, then, are probably aware, that Pearls are extracted from the shells of a large species of oyster, (about three times the size of common oysters,) which grow in the shallow seas about Ceylon, Sumatra, Japan, the Persian Gulf, and other places on the shores of Asia. These oysters are brought from the bed of the sea, several feet below the surface, by divers, who follow that perilous avocation as a means of living, and are able to remain under water for several minutes at a time.

The best Pearls are found imbedded in the soft pulpy substance of the oyster itself, but others, of an inferior quality, are often found imbedded in the shell, from which great care is required to extract them. Respecting the origin of Pearls great diversity of opinion has prevailed, but the most probable conjecture is that of Raumur, a French writer, who, about 120 years ago, paid much attention to this subject. He considered Pearls to be the result of disease, in the same way as stone in the human bladder is known to be; that they were originally fluid, forming part of the vital system of the animal, but that having burst the vessel or membrane which contained them, they hardened into a little round solid, which became the Pearl. This opinion is supported by a statement which has been made, that if these oysters be pricked while alive, a fluid will be discharged, which on hardening very much resembles a Pearl; and it is further supported by two other circumstances, which we shall presently notice.

The love of gain is such a ruling passion, that when men find there is either a large demand for an article, or a high price paid for it, they seldom fail to devise some means by which the supply shall be rendered more abundant. Accordingly many attempts were made to render the oysters more prolific of Pearls. These schemes appear to have been of three kinds. *First*, to prick the oyster; *second*, to perforate the shell; and, *third*, to introduce five or six small beads within the shell. The mode in which these processes acted was as follows.

First.—The Indians, after catching the oysters and opening the shells, pierced the oysters with a sharp instrument, when a few drops of glutinous liquid oozed out, which they received in little iron moulds, formed into a globular shape. When the globule had hardened, it assumed all the appearance of a Pearl. This description, which is met with in but one or two ancient authors, is not considered to be of sufficient authority, as nothing of the kind is known at the present day.

Second.—When the shell of the oyster is perforated with a small hole, the little inhabitant, to exclude unwelcome intruders, fills or stops the inner edge of the hole with a glutinous matter, which hardens into Pearl, not equal to the natural Pearls, but still possessing some value. This statement rests on better authority than the former, for Linnæus, the great botanist, announced that he had produced the same phenomena with mussels. It is necessary to remark here, that Pearls have been found in mussels off the coast of France, and that in the museum of the late Sir Joseph Banks, a mussel-shell was deposited, in which a small fragment of iron was found sticking, round which a pearl-like substance had collected. It was supposed that the iron was part of a sharp instrument, broken off in the act of piercing the shell.

Third.—The Chinese have a mode of enticing the oysters to the surface of the water, and inducing them to open their shell, (rather more successful it would appear than the mode of catching birds by putting a little salt on their tails,) the artful fishermen then drop into the cavity of the shell a string of five or six small beads, made of mother-of-pearl, and then allow the oysters to escape. This takes place in the Spring of the year and in Autumn, when the Pearl Fisheries occur, the beads are found to be encrusted with a sort of enamel, which gives them a close resemblance to Pearls. This deception is believed to be carried on at the present day in the Indian Seas.

It may be as well here to state, that mother-of-pearl is the interior surface, or scale, of the shell of another species of oyster, existing in the same seas; indeed

* See *Saturday Magazine*, Vol. II., p. 5 and Vol. VI., p. 178.

it is often seen in the shell of the common oyster, and being therefore much more plentiful than Pearls, can be substituted for them in the above piece of trickery at a small expence.

All of these schemes, however, are productive of pain to the poor little inmates, and we cannot but condemn them as cruel modes of providing decorarations for the persons of our fair countrywomen. It is, however, less objectionable than a method practised by the ladies of South America, who cover portions of their dresses with living diamonds, which the light emitted by the fire-flies of the country affords. The poor insects are attached by means of pins.

We now propose to show, that very accurate facsimiles of Pearls may be produced, although still, we regret to add, at an immense sacrifice of animal life; but we may previously remark, that attempts have been made to melt or soften small or broken Pearls into one larger one. A large Pearl is worth a great deal more than two Pearls of half the size, and this has induced many to try that transformation. Accounts have been given of a mode of softening the small Pearls, by steeping them in a mixture of strong vinegar and Venice turpentine; but it does not appear that the success was such as to induce a continuance in that plan.

In the sixteenth century glass-beads were constructed at Venice, and coated with a kind of pearl-coloured varnish, which gave them a rough resemblance to Pearls; but the result seemed to show that the resemblance was not very good, for they were shortly afterwards superseded by little balls of wax, covered with a pearl-like enamel; but, unfortunately, the enamel was not capable of resisting moisture, and it soon became eaten into small holes, so that these artificial Pearls required frequent enamelling.

We are not aware that any further improvement took place in these attempts to imitate nature, until about the year 1656, when M. Jaquin, a bead-maker in Burgundy, happening to look into a vessel in which some small fish (the *Cyprinus alburnus*, called in England the *blay* or *bleak* fish,) had been kept, he perceived a pearl-like powder, which had evidently come from the scales of the fish, and, by following this process, he obtained the powder at pleasure. He put a number of the scales into a small quantity of water and washed them well, then poured away the water, and repeated the process with clear water several times in succession, until nothing further could be washed from the scales. The water was then put by; a sediment fell to the bottom; and on pouring the water from the sediment, the latter appeared as a thick creamy liquid, having that delicate silvery appearance which distinguishes pearls. It instantly occured to him, that the discovery might be made a source of profit to himself. He therefore constructed small beads of plaster of Paris, and coated them with this new substance mixed with isinglass. The close resemblance to pearls was immediately acknowledged, and a great demand for them quickly arose. But the heat of the fire, as also the moisture of the human body, was found to injure the surface of the beads, and some ladies of Paris proposed to Jaquin that he should make hollow beads of glass, and coat them on the inside with his new pearl composition, which he called *Essence d'Orient*, or, Oriental Essence. He acquiesced in the proposal, and thus arose the mode of making artificial Pearls, which has existed but with few alterations to the present day. The attempt succeeded, and the manufacture of bead Pearls became an important branch of business.

The mode of making the bead and coating the inner surface may be thus briefly explained. All vessels made of what is called blown glass, such as drinking glasses, bottles, &c., are formed when the glass is in the state of paste. A hollow tube about three or four feet long is dipped into a pot containing melted glass, a portion of which adheres to the tube. The workman then blows through the tube from the other end, and the glassy paste becomes hollow, in a manner similar to the soap bubbles blown from a tobacco pipe. The blowing is continued until the glass has assumed nearly the form requisite, after which the finishing is performed by hand. But in making glass beads a different process is adopted. A very fine and narrow tube of glass is taken, one end is placed in the flame of a lamp, and the operator blows through it from the other end. When the end of the tube is melted, he blows it out into a globular form, breaks it off, and then proceeds with another. This is done with such rapidity, that an expert workman is said to produce from five to six thousand of these glass globules in a day; but, as some attention is paid to the shape and appearance of these beads, a great number are rejected on account of their ill-shape. In order to resemble nature more closely, these beads are often purposely made with blemishes, and of forms somewhat irregular, such as pear-shaped, oval, or flattened on one side, in imitation of natural Pearls, which are set in such a way as to show only one side.

The beads for the mock Pearls, are made in this manner, the glass of which they are formed having a blueish tinge to assist the imitation of Pearl.

The Essence d'Orient (or Pearl Essence, we may perhaps call it,) is then heated; a single drop is taken up on the end of a tube and dexterously blown into the centre of the bead through one of the two holes which always exist in them. The bead is then shaken about either in the hand, or in a machine, until the interior surface is completely covered with the paste. It is then left to dry, and the cavity of the bead is then filled up with white wax, which answers two purposes, namely, to strengthen the bead, and to make its weight more nearly equal to that of real pearl. A hole is then bored through the wax to receive the string.

Thus has this curious branch of business been brought to perfection, a pleasing instance of the manner in which the manufacture of a mere trifle or toy may be made a source of honourable and lucrative emolument. We believe that, up to a recent period, the descendants of M. Jaquin still carried on the manufacture in Paris, while in different towns of France large numbers of these little mock Pearls are being made daily.

The blay, or bleak, is a fish about four inches in length. They are found in great abundance in some rivers, and being exceedingly voracious are taken without much difficulty. The scales of 250 of these fish will not weigh above an ounce, and this again does not afford more than a quarter of an ounce of pearl powder; so that, it is computed, that 16,000 fish are necessary in order to obtain one pound of essence of pearl.

The river Seine, although abounding with this fish, does not furnish an adequate suppy. The scales of the fish are therefore sent to Paris from other rivers in large quantities in bottles containing solution of ammonia, which preserves the scales.

We may observe in conclusion, that it is remarkable that the only substance hitherto successfully employed in this imitation, is, like the Pearl itself, derived from fish. And when we observe, (which we

cannot fail to do,) that the interior surface of the shells of many fishes possess those delicate tints which form part of the beauty of a Pearl, we are justified in believing that there is some peculiar fluid existing in a large number of fishes, which, when dried, presents a surface having that beautiful appearance which we term *pearly*.

RUSSIA. No. IX.

Funeral Ceremonies. No. 2.

In our preceding paper of this series, we described the funeral obsequies of one of the higher classes, not because we were won by the costly array of the lordly funeral, where vanity too often would fain coquet with death, and ostentation bedizen with its tinsel the dark passage to the tomb, but because it afforded an opportunity of remarking those peculiar customs, which among the poor are neglected from sheer poverty.

The writer of this article, not many months ago, witnessed a scene of every-day wretchedness, which he cannot forbear to describe, as a contrast to the description given. In one of the principal thoroughfares of the ancient metropolis of Russia, during the Carnival week, his attention was attracted to a funeral of the humblest aspect. On a rough country cart, drawn by one miserable horse, and driven by a ragged peasant boy, was laid a coffin, formed from the trunk of a tree, rudely fashioned with the axe, and without one single emblem or ornament, except a coarse tattered quilt, half covering it, yet exposing to view the emaciated features of an aged peasant, with hoary hair and long gray beard. No mourners followed, excepting two peasant men, with an old time-bowed woman, who tottered by their side, and who wore the only mark of mourning, a rusty black ribbon bound round the head. The cart was preceded by a solitary priest, whose hurried step and restless air told that he grudged the unprofitable hour. Curiosity, think it not an idle curiosity, prompted an inquiry. The old man had dwelt in a common lodging-house for peasantry, and had gone to his rest the evening before, an evening everywhere in Russia devoted to festivity: his spirit had taken its flight whilst the din of revelry rung around him. He was unknown to those whom Christian charity had induced to follow him to his place of rest. A stranger had closed his eyes, and the chill hand of cautious charity had given him his coffin, and hollowed out his grave. The humble train passed on in silence unnoticed, or noticed but for one brief moment as the passer-by raised his hat, hastily crossed himself, and muttered the valedictory prayer.

Carriage after carriage dashed rapidly past, filled with the youth and beauty of the city, in their gala attire, hastening to the scene of promised enjoyment at the public promenade. Few cast a look towards the bier of the poor peasant,—for what had youth and beauty to do with old age, poverty, and death? The contrast was painfully striking.

Although by an *oukaze*, issued in 1801, the laws of the empire strictly forbid the interment of a foreigner, of different creed, within the limits of consecrated ground, the Greco-Russian Church refuses the mere ceremonial rites of burial to none. If, however, a Protestant, in his last hours, receive the Holy Sacrament, or the extreme unction, as will sometimes happen in remote parts of the country, from the ignorant, though well-meant, zeal of those around, to secure for him a portion of hallowed earth, he is considered as received within the pale of the church, from which, under the heavy penalty of the law, he can never secede should he chance to recover. All children subsequently born to him are legally subject to its discipline, and must be educated in its faith; and, even a posthumous child is placed in the same circumstances. Instances have frequently occurred, nevertheless, where bigoted ignorance has refused Christian rites to the body of a Protestant, though happily the instances are rare.

A distressing case of the kind recently occurred within thirty miles of Moscow. An Englishman of unblemished character, an overseer in the establishment of a Russian manufacturer, died suddenly at the works. His afflicted wife was naturally anxious that her husband's remains should rest besides those of his countrymen in the English burial-ground; but the proprietor, dreading the interference of the police, refused even the loan of a cart to convey it thither. Only a short time established in the country, she knew but little of the language, so little as to be scarcely enabled to make herself understood; every human being stood aloof;—the very peasants, influenced doubtless by fear of the legal responsibility, refused to lend their carts, though promised liberal recompense. The police urged instant burial, the master peremptorily ordered the corpse to be taken from his premises; and the desolate and friendless widow, as a last and inevitable resource, applied to the priest, "to give a little earth for charity." He refused, the deceased not having been of the Greek faith. Entreaties and bribes were alike in vain. Further delay being impossible, a shallow hole was scooped in the corner of an open field, by the Russian workmen whom he had superintended; by their hands he was laid shroudless, in his unblessed grave; his poor daughter, anxious that some semblance of a religious ceremony should mark the consigning of her deceased parent to the earth, attempted to read the sublime funeral service of our church; she sobbed through a few prayers, but overcome by her feelings fainted beneath the effort, and was borne off by her distracted mother. The hole was filled up, the business of the day went on as usual, and the bereaved family sought refuge and consolation among their countrymen in Moscow.

They sought it, and happily they found it too; nor did their wrongs go unredressed. The heart-rending circumstances of the case, were, as a matter of courtesy, laid before some individuals of rank and influence, previously to seeking redress through an official channel. The Metropolitan, a man of distinguished learning, piety, and benevolence, before whom the affair was laid, directed immediate inquiry to be instituted. The result confirming the statement given, the priest and the police received each a severe reprimand; and, had a vindictive spirit, in urging to extremities, prevailed, they would, undoubtedly, have been severely punished. The end, however, was attained; the body exhumed and placed in a coffin, was brought to the English burial-ground, where it was interred with Christian rites.

It is but justice to remark, that in Russia the higher authorities are always ready and energetic in correcting the abuses of subordinates, and in affording protection to foreigners of every nation and of every creed, but there is considerable difficulty in getting access to them. If, however, these scenes are witnessed in a country where toleration is part of the national religion, what may not be expected in those whence it is excluded?

Poverty.—That man is to be accounted poor, of whatever rank he be, and suffers the pains of poverty, whose expenses exceed his resources; and no man is, properly speaking, poor, but he.—Paley.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT.

No. III.

FIXED OR FLOATING SPECKS IN THE EYE—CAUSES, REMEDY, PREVENTION—EMPLOYMENTS WHICH INDUCE THE DISEASE—STRAINING THE EYE—SNOW BLINDNESS—EFFECT OF DARKNESS UPON VISION.

WE now proceed to notice a few only of the symptoms of *amaurosis*, and, as far as we can, to trace its cause to an injudicious employment of the organ.

(1.) Many of the diseased affections of the eye proceed indirectly from indigestion, a morbid condition of the stomach, the liver, and bowels, resulting from sedentary employment, and the consequent want of that exercise of the body which is so indispensable to the healthy action of all its parts. The fine delicate nervous filament, the retina, possesses a very remarkable property when subjected to pressure, namely, that of becoming luminous, or of conveying to the mind a luminous impression This may be seen in health and in a dark rooms, by pressing upon the eye-ball; but its inconvenient, and even alarming instances, occur when the stomach is deranged and headache is present; then the blood-vessels of the head are surcharged, and by pressure on the retina produce appearances of various forms, often a faint phosphorescent haze floating before the eye, varying in shape and colour, and sometimes of various colours at the same time. The morbid sensibility of the retina in these cases is often such, that persons have been able to read even in the darkness of night*; and it is not an uncommon remark with amaurotic patients, that an improvement in vision is observed while inflammation is present, which ceases as the inflammation subsides. These appearances are not so common as the presence of fixed or floating spots, (*muscæ*, or flies, as they are called,) which darken a small portion of the field of vision. Their presence is very common to persons of sedentary habit, after about thirty or forty years of age, often earlier, depending, of course, on the average state of health of the individual, and the "wear and tear" to which he has exposed his eyes. The fixed spots sometimes co-exist with the floating, and the latter are constantly varying in size and shape, which depend on causes not well understood. These spots sometimes appear as globules, or rings, or disks; they very commonly resemble particles of soot, transparent vesicles, or minute globules strung together like beads on a thread, or small bulbs with hairs attached to them, or waving lines. With some persons they are seen in the air, or only when the eye is directed to the sky, or a white surface; sometimes they appear only in the flame of a candle or lamp, and others see them only on the ground. Sometimes one eye only is affected, at other times both. They frequently precede or accompany indigestion, or bilious headache, or constipation, while they are often absent when the health is good. These floating spots do not generally interfere with useful vision, and they frequently disappear on looking through spectacles. Such are the general features of the floating muscæ. Their cause is said by some to depend on a disordered circulation in the vessels of the retina, while others attribute the cause to floating particles in the humours or minute points in the cornea.

The writer of this paper is himself the subject of this disease, and, therefore, feels a more than usual confidence in addressing what, he fears, is a large number of readers similarly affected to himself. If he succeed in removing from the minds of such, any ill-grounded fears and apprehensions concerning the ultimate result of these singular affections, one great object of the present article will be achieved; but a still more important object is to warn such of our readers who may be blessed with good and perfect visual organs how they employ them; that is, to establish in their own minds a clear definition of the use of an organ and of its abuse; they will then not have the excuse of ignorance, if, in after years, through any fault or misfortune of their own, they become amaurotic.

There is a case reported by Dr. Travers, in his *Synopsis of the Diseases of the Eye*, so interesting, and so much in point, that we proceed at once to lay it before our readers. It is the case of an intelligent young gentleman, written by himself, and shows clearly the origin, progress, and gradations of this disease. He says,—

About a year and a half ago, the first symptoms appeared which gave me any uneasiness with respect to my sight. For several months I read incessantly, not only throughout the day, but also for five or six hours each night by candle-light, and I now perceived numerous circular motes, which, combining, formed clouds of irregular figures before my eyes. These motes always appear when I look at the sky or any light-coloured object in a strong light; they move with the eyes, retaining for some time the same position, with relation to each other, and to the centre of vision; each consists of a slightly opaque circumference and a central spot, the diameter being, as well as I can judge, about four or five minutes of the circle of vision. Sometimes films appear curved or twisted like hairs, and of the same degree of opacity as the motes. There is a collection of these films always before the right eye, but at such a distance from the centre of vision as not to disturb sight. The number of the motes seems increased by violent exercise, as well as by close reading, or a disordered state of the stomach. Sometimes for a moment a small circular black spot appears near the centre of vision, and sometimes, though not so frequently, one faintly luminous.

The candle next appeared surrounded with a faint halo, which became more vivid as I continued this severe exertion of my sight. When my eyes are unusually weak, or a light is presented to them after I have been some time in darkness, instead of the halo, a globular appearance of a muddy yellow colour, surrounds the flame.

About six months ago, I began to be annoyed by the retina retaining impressions made upon it. After looking at any white or bright metallic object, on turning away my eyes, I distinctly perceive its outline, in a darker shade, on any surface to which I may direct my view; the impression lasting from two or three seconds to half a minute, according to the strength of light, the brightness of the object, and the length of time for which I have viewed it. The flame of a candle leaves its image impressed on the retina frequently for a couple of minutes, the sun for a still longer time, the image in both instances being of a muddy yellow colour.

A kind of penumbra surrounds light-coloured objects in a strong light, and prevents me from accurately distinguishing their outline. When the object is under a sufficiently small angle to be seen entire without moving the eye, it seems double; one image being such as would appear to a healthy eye, the other much fainter; thus is the moon seen, a piece of money, or the gilt letters over shop-windows. These appearances take place indifferently, whether I use either eye or both.

In a few instances, a very severe exertion of my eyes produced the appearance of innumerable black particles dancing before them.

When I read for any considerable time, I have a disagreeable sense of heat in my eyes, with pain in the eye-balls, extending to the lower part of the forehead. I am not constantly subject to headaches, though occasionally afflicted with them, especially if I delay breakfasting for any length of time after rising. My tongue is frequently foul for weeks together, my digestion seems weak, and I seldom enjoy a good appetite.

I ought to observe, that most of the above-mentioned

* This is stated on the authority of Dr. Jacob.

symptoms seem to have been mitigated since I came to London. Since the application of the blisters, the halo round the flame of the candle has nearly disappeared.

It appears then that the muscæ may be removed by attention to a few simple rules of regimen, by resting the eye, and giving it only a fair share of daily employment. If the general health be good, the constant presence of the floating muscæ may be regarded as perfectly harmless insects, which are solitary and will not increase; but if the health be in a low, fitful, and uncertain state, the muscæ, in common with the insect tribe whence they take their name, will increase and multiply as time goes on, and may in such case be regarded as the prelude to a still more disordered action of the visual organ.

In the first division of employments which induce this disease, we have spoken of such as are sedentary. Persons engaged in them are, like ourselves, students, writers, draughtsmen, &c.; also watch-makers, engravers, and such as are employed in some factories, as needle-workers, and those whose employments require the head to be bent over their work, by which the vessels of the eye are often surcharged with blood, and its powers taxed beyond endurance, by being strained to the perception of minute objects. The very familiar term which we have just employed, "straining the eye," is liable to the serious objection of being unmeaning, of conveying no precise idea to the mind, although the act indicated by this expression is sufficiently intelligible to all. It seems to consist in compressing the eye, by means of the muscles attached to the globe, and by this means it becomes more convex than is natural. It must, however, be admitted, that we are ignorant how it is that the constant employment of the eye, in viewing minute objects, where an unusual quantity of light is not employed, is injurious. It has been inquired, whether in these cases, the retina is in a state of excitement with morbid sensibility, a state approaching to inflammation? or whether it is the very reverse, in a state of impaired sensibility and defective vitality? Now if we may be allowed to hazard a conjecture, we should trace much of the disordered action of the eye from the above causes, to the employment of the double convex lens which is so customary with watch-makers, engravers, &c., whereby the adjusting powers of the eye are ever varying, and this, as we shall see further on, is productive of diseased action in the eye. Again, it must not escape our notice, that persons engaged in minute work, constantly employ artificial means for condensing the light by means of shades, globes filled with water, and double convex lenses, and so directing it to a small part of their work-table, while the rest of the apartment is comparatively obscure. It is notorious that minute work requires a good light, and it is probable, that the causes of disease in these cases are to be found in the second class of employments, which we are just about to consider as well as in the present class. The writer has conversed with a few intelligent watch-makers, who state that they suffer much from head-ache, &c., while they admit their inability to see clearly objects at great distances. It is also worthy of remark, that the writer has noticed in those persons, that the pupil is unusually small, contracted as it were to a mere speck. It would be worth inquiry, whether a clear view of minute objects is accompanied by the contraction of the pupil; this is a point which our readers can ascertain for themselves. We need not illustrate this division by cases, since the cause is sufficiently obvious, and the reader can supply instances from his own experience.

(2.) The sensibility of the retina is morbidly increased by causes opposite in their nature, while their effect is the same. Travellers inform us of a disease common to the inhabitants of snowy countries, which disease is called snow-blindness; and it is found necessary to protect the eyes by means of a goggle made of wood, leather, &c., with a slit opposite the pupil. Captain Parry and other arctic travellers make frequent mention of this disorder, and speak of covering the face with black crape, which proved an effectual remedy. On the other hand, persons confined in dungeons have acquired the power of distinguishing surrounding objects with the greatest facility in their obscure dwellings, wherein at their first entrance no light whatever could be detected. This power is due, in the latter case, to the peculiar mechanism of the iris, as well as to the increased sensibility of the retina. The iris is composed of two sets of muscular fibres, the one tending like radii towards the centre of the circle, and the other forming a number of concentric circles round the same centre, which centre is the pupil, whose diameter varies by the action of the two sets of muscular fibres which compose the iris. When a luminous object is seen the circular fibres contract, and the radial fibres are relaxed; and thus the size of the pupil is diminished. In dark and obscure situations the radial fibres contract, and the circular are relaxed; and the pupil is thus enlarged, so as to admit a greater quantity of light. The healthy action of the eye very much depends on the perfect operation of the fibres of the iris.

WIGS AND HEAD-DRESSES. No. II.

Wigs were not generally worn in England until many years after they were in common use in Paris. The first noticed in this country was worn by Henry the Eighth's fool, Saxon; and in Shakspeare's time the players resorted to the use of them to produce effect in personating different characters; that great poet makes Hamlet say,—"It offends me to the soul to hear a robustious periwig-pated fellow tear a passion to tatters."

In the reign of King Charles the First, long hair had become fashionable at the court, and as all were not furnished with flowing locks, it was necessary to supply the deficiencies of nature by art, and this gradually led to the introduction of the peruke, except amongst the members of the bar, who did not assume the wig until about 1670. The perukes were made to assume the appearance of real hair as much as possible, and arranged so as to flow over each shoulder and down the back; the size of these wigs continued gradually increasing through the reigns of Charles the Second and James, until, in the reign of William and Mary they had reached their fullest extent. No. 1 is a representation of the kind of wig then worn by persons of distinction. The size of these wigs was so excessive, that ten heads would not have furnished a quantity of hair equal to the contents of one of them; the curls were made to flow down the back, and hang over the shoulders, half way down the arms.

Louis the Fourteenth's wig was so large, (for the same fashion prevailed in France,) that he was said to rob the heads of his subjects to cover his own; and so great was the demand for hair in England, that in 1700, a young country girl received sixty pounds for her head of hair, and the gray locks of an old woman, after death, sold for fifty pounds; wigs in common were as much as forty pounds each. The clergy had hitherto, with some exceptions, worn their own hair,

but at the beginning of the eighteenth century they began to assume the description of wigs which has

No. 1.

only gone out of use in late years. No. 2 shows the manner in which the hair was worn by a Bishop of London in the reign of Charles the Second, before the clergy had assumed the curled wig of more recent years.

No. 2.

No. 3.

As the wig had reached its largest size during the reign of William, so in the succeeding reigns, those of Anne and George the First, it was more generally worn by all classes, and was made in the greatest variety of forms. About 1720, it was fashionable to tie one-half of it on one side into a club, as in No. 3. A few years after, bag wigs came into fashion; several ludicrous specimens of these are represented in the next engravings; the first two are copied from Hogarth's plates, about 1730, and the third was in

No. 4.

No. 5.

fashion in 1792. The bag was made of black silk to contain the *queue*, and was ornamented with a bow or rosette of the same. This rage for wigs was carried to such an extent, that even children were decked out in them. About 1763, the fashion of wearing wigs was on the decline, and that to such an extent, that the peruke-makers of London presented a petition to the king, in which they complained also of the vast

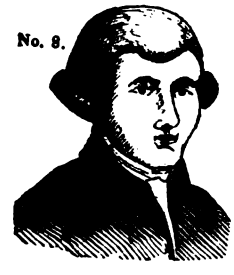
No. 6.

number of French hairdressers who had introduced themselves into this country.

At the end of the last century the wig began to fall into disuse; many contented themselves with their natural hair, in which they wore powder, and those who still retained this article of dress were satisfied with a wig of less imposing appearance; but still, in many cases, the *queue* was retained, and sometimes it was made of an extravagant length and thickness, tightly bound round with riband so as to resemble a solid mass rather than a bundle of pendant hair. The statue of George the Third, in Cockspur-Street, London, furnishes a good example of this appendage to the wig, but even this sinks into insignificance when compared with the *queue* which was formerly worn by the sailors in the Royal Navy; this reached nearly to the bottom of the back, and must have been very inconvenient to the wearer. These tails were abolished in the navy some years back, and shortly after the filthy powder worn in the hair of the soldiery was also abolished, and the hair was cut close.

The wigs of the latter part of George the Third's reign, as we have noticed, assumed a less dignified appearance, as shown in the annexed figures. Since

No. 7.


No. 8.

that time even wigs of this description have fallen into disuse, and the chief work for the peruke-maker now consists in the manufacture of natural scratches, as they are called, for the use of those whose health and comfort require such protection, and of those whose tastes deem them essential to appearances. The real wig is now confined exclusively to the bench of bishops, many of whom, however, do not wear it, and to the members of the legal profession, who cannot dispense with it.

SELF-LOVE but serves the virtuous mind to wake,
As the small pebble stirs the peaceful lake;
The centre moved, a circle straight succeeds,
Another still, and still another spreads;
Friend, parent, neighbour, first it will embrace,
His country next, and next all human race.
Wide and more wide, the o'erflowings of the mind
Take every creature in of every kind.—POPE.

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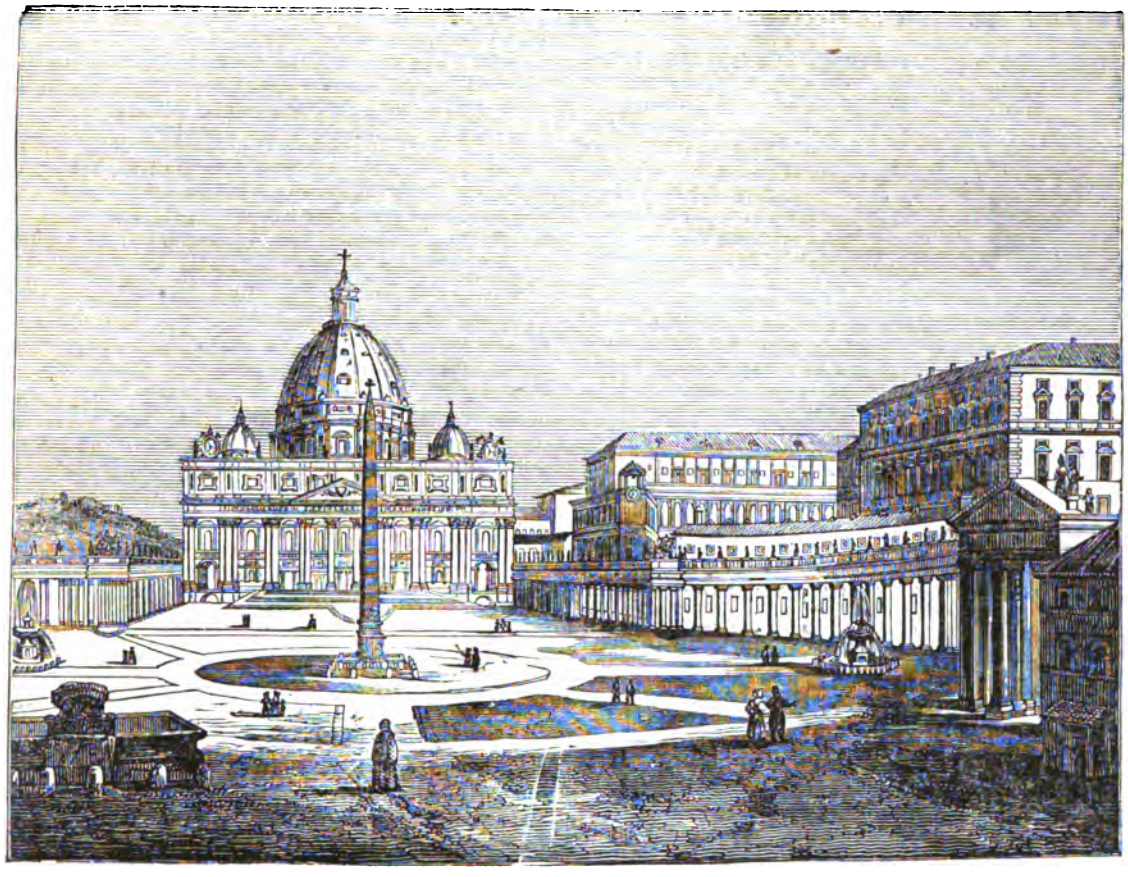
SOME ACCOUNT OF THE CITY OF ROME. PART VIII.



VIEW OF THE EXTERIOR OF ST. PETER'S.

HISTORY OF ST. PETER'S.

THE ancient basilica, which preceded the present Cathedral of St. Peter, was erected in 324, by the Emperor Constantine; and it has been a constant tradition of the Romish Church that the spot on which it stood was the burial place of St. Peter, after his supposed martyrdom on the site of S. Pietro in Montorio. In the middle of the fifteenth century this basilica was verging on ruin; and the reigning pontiff, Nicholas V., undertook to erect a new building "on such a scale, and with such accompaniments," to use the words of Mr. Woods, "that even the present work, with all its appendages, and the adjoining palace of the Vatican, are hardly equal to it. Three straight streets, with porticoes on each side, were to have conducted to the church. This was to have been formed on the most magnificent scale, and finished with the richest materials: adjoining would have been a palace, large enough to afford accommodation to the pope and all his court; to all the Cardinals and their attendants; to various officers of government; and, besides this, spacious apartments for as many sovereigns with their numerous suites, as could be ever at one time at Rome: add to all this, pleasure-grounds, gardens and fountains, and a great theatre for the ceremonies of coronation*." The pope died, however, and with him his vast designs. Fifty years afterwards, the project of building a new church was resumed by Julius II., who invited different artists to send in their plans. "Such a competition," continues the author of *Letters of an Architect*, "took place on this occasion, as is not to be seen in these degenerate days: Bramante; Giuliano di San Gallo; Fra Giacomo, or perhaps rather Fra Giocondo; Peruzzio; Raphael; and J. Battista Berti, produced their designs; but that of Bramante was preferred."

Bramante began to clear the ground by pulling down a part of the old edifice in 1503; the first stone of the new structure was laid by Julius himself, on the 18th of April, 1506; it was deposited under one of the four enormous pillars which support the cupola. Bramante lived to see the whole of these four pillars raised as high as the cornice, and upon them the arches turned, upon which the great dome itself rests. He died in 1514. His patron, Julius II., had died the previous year; but the successor of Julius, Leo X., carried on the work with increased energy. "It is well known," remarks Dr. Burton, "that both Julius and Leo carried to a much greater length than any of their predecessors the sale of indulgences. The justification of such a measure was principally taken from the desire entertained by the Roman Pontiff for rebuilding the church of St. Peter: and as the Reformation is certainly to be ascribed in a great degree to the offence raised by this scandalous traffic, we may say, without aiming at a paradox, that the efforts of the Roman Catholics to beautify their Metropolitan church, contributed, in some degree, to produce the Reformation."

* The coronation of the Emperor, apparently is meant. If the design of Nicholas had been carried into effect, his theatre would never have been used; for it happens that he was the last pontiff who was "importuned by the presence of a Roman Emperor."

The architects who succeeded Bramante were Giuliano and Antonio di San Gallo, with whom was associated the great Raphael who had already immortalized himself by the great paintings which he had been executing in the Vatican since 1508. Dr. Burton quotes a letter written by Raphael upon the occasion of his appointment, wherein he says, "His Holiness, in conferring an honour upon me, has placed a great load upon my shoulders; this is the superintendence of the building of St. Peter's. I hope that I shall not sink under it: and the more so, as the plan which I have made for it pleases his holiness, and is commended by many men of genius. But I raise my thoughts even higher. I could wish to reach the beautiful forms of the ancient buildings; nor can I tell whether my flight will be like that of Icarus. Vitruvius affords me great lights, but not enough."

Raphael died in 1520, and Giuliano di San Gallo before him; they did nothing beyond strengthening the four great pillars which Bramante had raised, and which, though 59 feet in diameter, were thought insufficient for the weight of the intended cupola. The next architect was Baltassar Peruzzi, who, despairing of the time and money required for the completion of Bramante's design, intended to adopt a Greek cross for the plan; the edifice was under his superintendence during the pontificates of Adrian VI. and Clement VII., but it advanced very slowly, in those disturbed times. Paul III. who ascended the papal throne in 1534, employed Antonio di San Gallo, who brought the design back again to a Latin cross; a model of his intended edifice, which was made by his servant, at the cost of 4,184 crowns, may be still seen in the present church. He strengthened the supports of the intended cupola, vast as they had already become; and died in 1546.

We have now reached the period in which Michel Angelo was called in to superintend the work, he being then 72 years old. In the brief by which he received his appointment from Paul III. he was intrusted with authority to do and undo whatever he pleased; and in the same document he insisted upon the insertion of a declaration that he undertook the work for the love of God, and without any salary or reward. "Nor was this," says Mr. Woods, "a vain boast, for although Paul III. repeatedly urged his acceptance of some remuneration he invariably refused it." Michel Angelo began by producing a model of the building, according to the altered design which he intended to adopt. "There was, perhaps, a little ostentation in producing a model of the altered design, in fifteen days, and at the expense of 25 crowns; while San Gallo's model had occupied several years: but St. Peter's at this time had become a standing job, and the underlings employed in it, instead of feeling any zeal to complete it, considered an appointment in the building as an establishment for life. All this Michel Angelo endeavoured to put an end to, and excited great ill-will towards himself for so doing; but his wonderful talents and high character carried him through all opposition." Michel Angelo seems indeed to have had even a larger number of enemies than usually fell to the lot of great artists in those days; and Julius III., who succeeded Paul III. in 1550, was soon assailed from all sides with complaints of the overbearing temper of his architect, and of his determined opposition to the plans and labours of the most experienced brethren. The pope continued firm in his attachment, but Michel Angelo, despite of the countenance afforded him by a new diploma, confirming all his former powers, was so wearied by the incessant clamours and manœuvres of his enemies, that he would willingly have retired to end his days at Florence, had he consulted only his private ease. The feelings which he entertained upon the subject are often expressed in his letters to his friends; in one to Vasari he says: "My dear friend George, I call God to witness, that I was engaged against my will, and with very great reluctance, by Pope Paul III., in the building of St. Peter's ten years ago: and if the construction of that building had been followed up to the present day in the manner it was then carried on, I should now be arrived at such a point in the building, that I should turn to it with delight; but from want of money it has proceeded and still proceeds very slowly, just as it has come to the most laborious and difficult parts; so that by abandoning it now, the only consequence would be, that with excessive shame and impropriety, I should lose the reward of the fatigues which I have endured these ten years, for the love of God." He concludes, "To make you understand the consequence of abandoning the said building; in the first place, I should satisfy several scoundrels, and I should be the occasion of its falling to ruin, and perhaps of its being shut up for ever."

Michel Angelo began his labours by strengthening the four great piers, which, although they had been repeatedly reinforced, did not even yet appear to him so strong as they ought to be. He returned to the plan of a Greek cross, widened the tribune and transepts, and gave a much freer area than his predecessors had projected. "To what point he carried the work," says Mr. Woods, "I do not know: but the whole, as far as the extent of the Greek cross, seems to have been continued nearly according to his design." He died in 1563. The two small cupolas were finished by Vignola, in 1573. The great cupola was completed in 1590: Michel Angelo had raised the *drum*, or the *tambúro* as the Italians call it, that is to say, the cylindrical part, which rises to the springing of the arch of the dome. Its completion was the work of Giacomo della Porta and Domenico Fontana, who were the architects of Sextus V.; and the zeal of that pope being as great, if not greater, than that of any of his predecessors, 600 workmen were employed night and day, and the money monthly expended was 100,000 golden crowns. By this incessant labour the cupola was completed in the short space of twenty-two months,—or by the month of May, 1590; the outer covering of lead was all of the dome that remained unfinished; the lantern indeed was not yet erected.

Paul V., who occupied the papal chair from 1605 to 1621, pursued the work with equal ardour. At his accession a part of the ancient basilica was still standing; he lost no time in pulling it down, and on the 18th of February, 1608, laid the first stone of the great entrance. His architect was Carlo Maderno, who returned to the original plan of the Latin cross, and finished the body of the edifice in 1614. The great colonnade which stands in front of it was added by Bernini, under Alexander VII., who reigned from 1655 to 1667. The sacristy, which, strictly speaking, has nothing to do with the main edifice, was added so late as 1780 by Pius VI.

"How fortunate," exclaims Forsyth, "that a structure created by so many pontiffs, and the subject of so many plans, should keep its proportions inviolate, even in the smallest ornaments! Michel Angelo left it an unfinished memorial of his proud, towering, gigantic powers, and his awful genius watched over his successors, till at last a wretched plasterer came down from Como, and him we must execrate, for the Latin cross, the aisles, the attic, and the front." Mr. Forsyth is not the only person who has heaped a load of censure upon Carlo Maderno; but it is a disputed point among the critics whether the Greek cross would have been preferable to the Latin.

The reader will observe from this sketch that upwards of one hundred years elapsed before the body of St. Peter's Church was completed; and that nearly three centuries were required to bring it to its present form. In the middle of the seventeenth century, Carlo Fontana drew up an account of the building, by order of Innocent the Ninth, together with a loose estimate of its cost, not from the sums actually expended, for many of the accounts were lost,—but from the value of the materials employed. According to his calculations there had been expended upon it up to that time 47,151,450 millions of *scudi*, or about £11,625,000 of our money. This amount does not include the cost of the bronze chair of St. Peter, in which was used 219,061 lbs. of that metal, nor of the bronze confessional which contains 186,392 lbs.

THE APPROACH, COLONNADE, AND FRONT.

The Church of St. Peter stands on the left or western side of the Tiber, the great bulk of the city being on the opposite side. "There is no distant point of view," says Mr. Woods, "in which this church gives an impression of great magnificence, or from which it has the appearance of being such an immense building as it really is. This is owing to the situation, and perhaps no building of great consequence was ever so badly placed. It stands in a hollow between the Janiculan and Vatican hills which are connected by a neck behind it: so that on three sides it is surrounded by slopes, rising almost immediately from it, and about equalling the height of the nave, and in front, in spite of the large space before it, it seems encumbered with houses, which prevent a view down to the base." In fact, were it not for the dome, the buildings of the Vatican would actually overtop the church, as the reader may observe by referring to a former engraving.*

* See *Saturday Magazine*, Vol. IX., p. 121.

"The first modern structure," says Mr. Hope, "that attracted my attention was St. Peter's, that splendid basilica, built over the tomb of the prince of the Apostles, in the capital of Christendom, at the expense of all the Catholic part of Europe, which took more than a century to finish, was fabricated out of the spoil of the most splendid ancient edifices that remained, and is the most gigantic and most superb structure that the modern world can boast, or that is ever likely to rise in it.

"In the way to it I passed over the bridge of St. Angelo, decorated with statues by Bernini, that look, from the distortion of their limbs, and the flutter of their draperies, as if caught in a whirlwind; and by that still more imposing mass, once the tomb of Adrian, now the citadel of Rome, where Belisarius defended himself against the Goths, by throwing down upon them the marble statues that adorned its numerous zones.

"From that point a noble avenue should lead to the place of St. Peter's, in order to complete its magnificence—a shabby street forms the approach. When, however, the circular colonnade, the central obelisk, the two foaming fountains, casting day and night, without ceasing, a vast stream into the air, and at the further end of a gradually ascending square, the immense façade, and the proud dome of St. Peter's suddenly opens upon the sight, all former impressions vanish, and admiration only remains. But when this again begins to cool, one smiles at the Egyptian obelisk carrying the Christian cross; one regrets its pedestal, too narrow for the spread of its base; one condemns in the Church its front so much broken by partial projections, its pediment standing on a base too narrow, and an expanse too small, and rendered evidently useless by the ponderous attic that rises behind it, and crushes the façade to which it was intended to give elevation.

"Contemplating those columns of nearly nine feet in diameter, but which, formed of a masonry of small stones, only look, on a near approach, like small turrets, one cannot help casting a lingering look back on the portico of the Pantheon, and thinking that elevation of insulated columns of granite, of one single piece, though smaller in its dimensions, grander in its conceptions, and more striking in its effect, than these clusters of huge pillars, all reticulated with joints and jammed up against a wall.

"Undoubtedly the accessories to St. Peter's are fine; still they do not impress one like the vast areas that precede and lead to the imperial mosques at Constantinople, form an intermediate space between the bustle of a city and the silence of the house of God, and prepare the devout for meditation and for prayer."

The circular colonnade in front of St. Peter's is considered the master-piece of Bernini. It is composed of four rows of columns, forty feet high, and five feet in diameter, with a complete entablature; the pillars are 256 in number, and they are surmounted with 192 statues of saints, each 11 feet in height. The area which this colonnade encloses is 728 feet in length; its width at the broad end is 606 feet. In the centre rises an Egyptian obelisk, of one unbroken piece of granite, to the height of 132 feet, 48 of which are occupied by the base on which it stands; and on either side of the obelisk is a large and splendid fountain.

This colonnade is a fine erection. "It is beautiful in design," says Mr. Woods, "graceful, and even magnificent; yet magnificence is not its character. . . . The design has richness and magnificence; but it has not majesty or sublimity; and it is this want of majesty which makes one unwilling to admit its size, and communicates an appearance of uselessness." This writer expresses an opinion that the design would have been better on a smaller scale, with Corinthian columns hardly as high as the present, and ornamented Corinthian entablatures. "But you will ask me, if thus enriched and adorned, would it form a suitable approach to St. Peter's? I answer, no, nor does it now; and the proof of this is that it looks better any way than towards the church. It is more beautiful alone than united with the building it was meant to accompany."

This want of harmony with the building itself seems to be generally admitted as the great defect of the colonnade; it has great beauty, but has evidently no business to be where it is. "How beautiful the colonnades!" exclaims Mr. Forsyth, "How finely proportioned to the church! How advantageous to its flat, forbidding front, which ought to have come forward, like the Pantheon, to meet the decoration! How grand an enclosure for the piazza! how fortunate a screen to the ignoble objects around it. But, advance or retire, you will find no point of view that combines these accessions with the general form of the church. Instead of describing its whole cycloid on the vacant air, the cupola is more than half hidden by the front; a front at variance with the body, confounding two orders in one, debased by a gaping attic, and encumbered with colossal apostles. One immense Corinthian goes round the whole edifice in pilasters, which, meeting a thousand little breaks and projections, are coupled and clustered on the way, parted by windows and niches, and overtopped by a meagre attic. Yet the general mass grows magnificently out, in spite of the hideous vestry which interrupts it on one side, and the palace which denies it a point of view on the other."

The main front of St. Peter's must be examined from the area which this colonnade encloses. The common remark is that this front is more that of a palace than that of a church; it is 160 feet high and 396 wide. It consists of two stories and an attic, with nine windows to each, and nine heavy balconies awkwardly intersecting the Corinthian columns and pilasters at half of their height. The pillars of the front are 88 feet in height, including the base and capital, and eight feet in diameter; yet the whole front looks much smaller than it really is. Mr. Woods seeks the causes of this apparent diminution in the composition of the front itself, as well as in other circumstances. The breaks of the entablature have the effect of reducing the columns and pilasters into ornaments, "and one cannot imagine," as he says, "mere ornaments of such gigantic dimensions." Another cause is the division of the height into three stories, and from this arises the greater similitude which it bears to a palace than to a church. "An enormous palace is grand; but still the imagination is conducted towards the usual appearances of human life." The dimensions of an ordinary palace form the standard by which a spectator estimates the dimensions of a front which inevitably excites in his mind the idea of a palace; the stories form a scale by which he measures the whole height, and although the judgment to which he is insensibly led be the result of a misapplied proportion, still the effect is produced. "Then the attics form another story, and who wants garrets thirty feet high?" It is because nobody wants them that nobody can think them so high as they are; and a spectator, looking at the attics of the front of St. Peter's, naturally judges of their dimensions by the standard which he applies to the attics of a palace. It is from a similar cause that the colonnade looks much smaller than it is,—it is useless; "it is palpably a thing of mere ornament, not connected with or forming a part of the building, or applied to any useful purpose, and the understanding is not easily reconciled to such great masses thus employed."

There are five entrances in the front of St. Peter's. They lead into a covered portico or vestibule, the length of which extends along the whole width of the front, and beyond it at either end, so as to equal 468 feet; its width is forty feet. The true magnificence of St. Peter's, observes Dr. Burton, begins here. Mr. Forsyth speaks in high terms of this lofty vestibule, "vaulted with gilt stuccoes, and paved with various marbles, lengthening on the eye by a grand succession of doors, and niches, and statues, till it ends in the perspective statue of Charlemagne. This is one architectural picture which no engraving can flatter." The statue of Charlemagne is equestrian; it occupies the left extremity; at the right one is a similar statue of Constantine. From this vestibule five doors lead into the body of the edifice.

DESCRIPTION OF THE INTERIOR.

ACCORDING to Dr. Burton, the length of the interior of this church is 609 feet from wall to wall; if the thickness of the walls and the depth of the portico be included, the length is 722 English feet. The width of the nave is 91 feet, and its height to the top of the vault is 152 feet. The length of the transepts is 445 feet. Upon the floor, which is composed of large blocks of marble of singular beauty, and disposed in various figures, are marked the lengths of some of the principal churches of Europe, as well as that of St. Peter's itself; they are given thus:—

St. Peter's	837 palms		609 feet.
St. Paul's, London	710	„	521 „
Milan Cathedral	606	„	439 „
St. Paul's, Rome	572	„	415 „
S. Sophia, Constantinople	492	„	366 „

The proportion of marble is astonishing; much of it is ancient, and the varieties are of the greatest rarity and

beauty. The ceiling is composed of gilt stuccoes on a white ground. "The chief of these stuccoes," says Forsyth, "has already fallen a victim to the vanity of an old priest,—the late pope [Pius the Sixth], whose arms are carved, painted, inlaid, cast, or hammered all over St. Peter's, had long beheld with envy the middle orb of the vault, adorned with the dragon and eagle of Borghese; but dreading the imitation of his own example, he durst not supplant it openly. It therefore fell down in the dark (by accident to be sure), and was presently replaced by the armorial puff of Braschi." Braschi is the family name of Pius the Sixth.

The pilasters between the arches of the nave are not of marble but of stucco, their height is eighty-three feet, and in their recesses are statues of the founders of various religious orders. The side-aisles are about twenty-one feet in width, and opposite to each arch of the nave is a chapel recessed back from these aisles. These chapels are well worthy of observation from their splendid decorations. "Mosaic-work and the richest marbles are scattered about them with the greatest profusion, and almost all of them contain a specimen of that wonder of the art—pictures executed in Mosaic."

It is the common remark that the profusion of marble and gilding in St. Peter's is destructive of that solemnity which ought to prevail in a religious edifice. "Were I made pope," says Simond, "I would signalize my taste by daubing over the variegated marbles and gilt ceiling with one uniform tint; the mildest and least obtrusive I could find: yet would I do this only with a wash easily removable, that my pontifical successor, infallible as myself, so long as he lived, might if he pleased restore his Basilica to its wonted finery. I would also wall up three-fourths of the windows, and cover the others with a transparent warm colour, like a certain small window (the *Spirito Santo*) that I observed at the upper end of the nave; in hopes of bringing the Italian world to a proper sense of the beauty of that *dim religious light*, so becoming a place of worship, but for which they have not the least taste at present. I omitted to mention that although the interior of St. Peter's is dazzling at first sight, with the apparently universal richness of its materials, yet on near inspection I observed that much of the surface was only a brick wall, gray washed, which looks decidedly better than the parts covered with variegated marbles. On my repeated visits to St. Peter's, I always found it greater and more impressive in the evening twilight than during the day. Strangers are much struck with the mild temperature of St. Peter's; as much of the heat which finds its way into it during the course of an Italian Summer, lingers there all Winter, forming a nearly even temperature throughout the year."

Immediately under the dome stands the *Baldacchino*, or canopy which covers the high altar, beneath which the tradition is, that the body of St. Peter reposes. This canopy is, according to some accounts, 122 feet high; and it is a common saying that its height is equal to that of the Farnese palace,—one of the loftiest in Rome. It is almost entirely of bronze, and the ornaments are chiefly gilt; "the four pillars which support it are twisted, and in other respects it is by no means in good taste, nor in unison with the majestic simplicity of the rest; but from its vast size, and the richness of the work, it can hardly fail to be admired." Near the Baldacchino, and against the last pillar of the nave, stands the statue of St. Peter, which, according to the statement of a Roman antiquary, was made by order of St. Leo, out of the bronze of the statue of Jupiter Capitolinus; its workmanship is extremely rude, "and though it is called a bronze statue," says Dr. Burton, "it has much more the appearance of iron. It is the figure which is so frequently kissed by the faithful: no Roman Catholic will pass it without going through this ceremony; and the usual form is to kiss the foot two or three times, pressing the forehead against it between each salutation; some will repeat each ceremony much oftener. The right foot projects for this purpose, and great part of it is worn away by the operation; which calls to mind the words of Cicero, in his description of a statue of Hercules at Agrigentum, 'that his mouth and chin were somewhat worn, because in their prayers and thanksgivings they were accustomed not only to worship but to kiss it.'"

The tribune contains the bronze chair, within which is said to be the identical seat used by St. Peter, and the earlier bishops of Rome. "It would be the height of temerity," says Dr. Burton, "to question the genuineness of this chair, after what Bonanni has said upon the subject. The reader may perhaps wish to see the passage, but he must not expect me to incur the penalties of it by attempting to refute it. 'This is the chair of St. Peter, which he occupied as universal pastor till he suffered death for Christ's sake. This fact has been so fully proved that the few sectaries who deny it must be most barefaced, or a set of children, and silly children too, such as Velcinus whom Roffensis has refuted, Sebastian of France, and some obscure Englishmen to be found in Saunders.' Besides the danger of classing ourselves among these our unfortunate countrymen, it would be lost labour to dispute the question after the arguments adduced by Bonanni. In the first place the miracles that have been wrought by it fully attest its apostolical antiquity. Secondly, Calvin doubted because it was made of wood, so perishable a material. 'But if this were a true ground for doubt,' says the honest Bonanni, 'the true cross and the cradle of our Saviour are made of wood, and nobody doubts about them.' It would, perhaps, have been more to his purpose to have reminded his readers, that Eusebius, who wrote in the fourth century, says that 'the episcopal chair of St. James was still shown at Jerusalem in his time.'"

The intervals between the pillars which separate the nave on either side from the aisles, are filled by twenty-four colossal marble statues, "representing the Fathers of the Church in finical attitudes, and their draperies in high flutter; the very reverse of antique simplicity." On this subject the critical observation of one of the numerous architects of St. Peter's, and the smart reply of one of the sculptors, form a standing Roman jest; "What makes your draperies fly about in this manner?" said the one. "The wind through the cracks in your walls!" answered the other. "The draperies continue to fly about although no cracks are now seen except in the cupola, rent six years ago (1811) by the shock of an earthquake which damaged many other edifices, and the Coliseum in particular. This cupola had been secured with an iron hoop bent round it; but that hoop, strong as it was, has lately been found not only broken through, but riven asunder,—an ominous circumstance this undoubtedly; and the curious who walk in St. Peter's must look to it."

On entering St. Peter's, every observer is astonished that its dimensions appear so much less than they really are. This has been considered by some as a merit, by others a defect. Dr. Burton calls it the principal excellence of the whole; "it is the beautiful adaptation of the proportions, which distinguishes this edifice from every other. Accordingly there are many objects which seem small, or only of the common size, which are really far above it. As an instance of this, the two angels may be mentioned, which support the fonts on the first pillars of the nave: they have the appearance of representing children, but are really larger than the natural size of a man. So also the dove with an olive-branch in its mouth, which occurs so frequently in this cathedral, (being the arms of Innocent the Tenth, Pamfili,) and forms an ornament on each of the pillars of the nave, seems to be easily within reach of every person, but can with difficulty be reached by the hand of the tallest."

"After all the abuse," says Mr. Woods, "which has been bestowed on the building for looking little, and all the absurd admiration it has obtained for this defect, the spectator must perceive at once that he is in the largest, far the largest room he ever saw, and if he have any sentiment in the art, he must feel the strong impression of a most noble and magnificent piece of architecture:—of one, where the richness of the material is combined with justness of proportion, and where science, taste, and genius have united with riches and power to produce sublimity. For my own part I was indeed on my own guard against the deception, but it seemed to me to be impossible that any one should seriously believe the cupids or angels at the font to be no bigger than little children, or suppose the doves mentioned by Eustace to be of the natural size*."

Mr. Woods, however, admits that the interior does look smaller; but instead of ascribing it to the excellence of the proportions, he tells us that "a great part of the secret lies in a single word,—disproportion." This view is supported by a critic in the *Quarterly Review*, who observes that upon a very little consideration it must appear a most extraordinary error to regard the apparent diminution as a merit. "If indeed it be owing to the proportions of St.

* "The figures of the Evangelists," says Mr. Mathews. "which decorate the inside of the cupola, do not appear larger than life; and yet the pen in St. Mark's hand is six feet long, from which we may calculate their real stature."

VIEW OF THE INTERIOR OF ST. PETER'S.

Peter's, that it appears less than it is, this must be considered as a proof, not that its proportions are exactly what they ought to be, but that there is something wrong about them; for its magnificent dimensions are generally and justly regarded as one fit cause of our admiration, and therefore that must be thought a defect which conceals their immensity. If, on the other hand, it be a merit in the proportions of St. Peter's that they diminish to the eye its real size, then, that size must be a defect, and the expense and labour of producing it must have been more than wasted. In truth, however, we doubt altogether the justness of the theory, which attributes to the general proportions of a building, unassisted by its darkness or lightness, the power of diminishing or augmenting the whole magnitude of a building. We think the true cause of the apparent diminution of St. Peter's, in part at least, may be the great magnitude of the numerous statues in the church. These are, in fact, all colossal, and as our eye is accustomed to statues more near the size of life, they serve as a false standard, by which we measure the church in which they stand. We suspect also that statues of white marble have, from their brilliancy of colour, the appearance of being much nearer the eye than they really are, which must of course diminish their apparent magnitude, and render the scale afforded them still more fallacious. The great light of St. Peter's, especially when contrasted, as it will be involuntarily by all foreigners, with the gloominess of their own Gothic cathedrals, contributes to the same effect of reducing its seeming dimensions."

GENERAL APPEARANCE OF THE INTERIOR.

"A NOISY school for children in one corner; a sermon preached to a moveable audience at another; a concert in this chapel; a ceremony half interrupted by the distant sounds of the same music in another quarter; a ceaseless crowd sauntering along the nave, and circulating through all the aisles; listeners and gazers walking, sitting, kneeling; some rubbing their foreheads against the worn toes of the bronze St. Peter, others smiling at them; confessors in boxes absolving pènitents; *laquais de place* expounding pictures; and all these individual objects and actions lost under an artificial heaven, whose grandeur and whose beauties delight and distract the eye. Such is the interior of this glorious edifice,—the Mall of Rome; but religious sentiments are perhaps the last which it inspires."

"The view of the interior of St. Peter's" says Mr. Williams "is perhaps, the best near the bronze statue of St. Peter. We saw it under the most striking effect, adorned with the beams of the sun, playing upon its gorgeous magnificence,—the noble dome with its various colossal paintings in Mosaic, of angels, prophets, and apostles, the latter, in the spandrils, at least twenty-five feet in height. In the transept of the cross are seen the noble sepulchral monuments of the popes, by Canova, Bernini, Michel Angelo, and others; splendid pictures in Mosaic, designed by Raffael, Domenichino, Guercino, and Guido, scarcely distinguishable from the finest paintings; grand columns of marble, porphyry, and granite, the gigantic supporters of the dome, each of which, were it hollow, would contain hundreds of people. Numerous colossal statues of saints, in niches at least thirteen feet high; the various and precious stones which impanel the walls of the whole building; the richness of the ornamented roof; the galleries from which the relics are occasionally exhibited; the great altar of Corinthian brass, by Bernini, (the height of which is not less than that of the highest palace in Rome,) with its twisted columns wreathed with olive; the hundred brazen lamps continually burning, and surrounding the tomb of the patron saint, with its gilded bronze gate, enriched to the utmost with various ornaments; the massive silver lamps; the hangings of crimson silk; the chair of St. Peter, supported by two popes, statues of great magnitude; the pavement, composed of the most rare and curious marbles, of beautiful workmanship; the statue of St. Peter, with a constant succession of priests, and persons of all descriptions kissing his foot;—form a whole not to be paralleled on earth: especially when seen as I saw it, with the sun's beams darting through the lofty windows of the dome, throwing all into mysterious light, tipping the gilded and plated ornaments, and giving additional richness to

the colours of the Mosaic paintings, and to the burnished silver lamps, which sparkled like little constellations; while the effect of all was heightened by the sound of the organ at vespers, swelling in notes of triumph, then dying upon the ear, and sinking into the soul; the clear melodious tones of the human voice, too, filling up the pauses of the organ, diffusing a deeper solemnity through this great temple, and making us feel an involuntary acknowledgement to God, who had gifted man with such sublime conceptions."

The inside of St. Peter's has fewer faults than the outside. "One is astonished," says Mr. Hope, "to find so much splendour, and even glitter, united with such an air of repose, of majesty, and of quiet. There is a serenity of look, and an equability of temperature in this vast edifice, which throws over all its parts an inexpressible charm; and in many of its finishings, by peculiar good luck, have been avoided a number of blemishes in architecture, that were in high vogue, at the time it was finished. One wonders, for instance, how its ceiling should have escaped allegorical paintings. Bernini, however, who had the worst taste of any man who ever acquired the reputation of a great artist, was still in time to exhibit some of his wretched conceits. Treating the adorning of the first church of Christendom in the same tawdry flippant style as he would have done that of a temporary stage, he contrived not only to introduce at one end of the vestibule a theatrical exhibition of Constantine starting at the vision of the cross, but to place in the central point of the church a transparency of the Holy Ghost, surrounded by a glory of rays of plaster gilt. Yet such is the immensity and splendour of St. Peter's that this defect and that of the twisted columns of the altar-piece, and a hundred others, are absorbed in the galaxy of beauties with which they are mingled.

"Yet has not St. Peter's, among all its magnificence, above one or two excellent works of art. Michel Angelo has left his name on a small and pitiful Pietà: Algardi has intrusted his celebrity to an immense bas-relief which imitates a painting, and consequently fails in its effect; and on every side you see gorgeous mural monuments, which being neither mere decorations of walls, nor positive sarcophagi, encroaching too much for the former, and too little detached and fanciful for the latter, have not the imposing appearance of the most uncouth Gothic tomb. Among these, however, that of Paul the Third, by Guglielmo della Porta is much spoken of, and that of Pope Rezzonico by Canova deservedly admired. To judge of the size of this enormous pile, two hundred feet longer, and a hundred feet higher, than St. Paul's, one should ascend the cupola, and look down upon the inside. It is here that, suspended over an immense abyss, not hollowed out by the potent hand of nature, but formed by the slow manual operation of man, that man himself looks like an insect creeping within his own work."

The feelings excited by this edifice in a religious mind will be of a very mixed character, and at times of a tendency most painful. The vastness, the symmetry, the beauty and lightness, of the architecture, impart to it "a character of loftiness and perpetuity," perhaps unequalled by any other edifice; yet to some it may seem the "presence-chamber of the monarch of the world, rather than the scene which a sinner would select in order to meet his God." "From this temple of high beauty and exquisite skill," to use the words of an eloquent writer, "have any waters issued forth to heal the sickly places of the moral wilderness? Alas! is it not here that the slumbers of the soul are the most entire,—that the despotism of ignorance is the most cruel,—that the degradation of the intellect is lowest, and the darkness of the heart the most unbroken and profound? Is it not here that the deep warning falls the loudest upon the startled ear? 'Woe unto thee Chorazin! woe unto thee Bethsaida! for if the mighty works which were done in thee had been done in Tyre and Sidon, they would have repented long ago in sackcloth and ashes. Verily I say unto you, It shall be more tolerable for Tyre and Sidon in the day of judgment than for thee.'"

"How perfect a contrast of feeling," exclaims the same writer, "have I experienced sometimes, when standing within that majestic edifice of St. Peter's! This hour, the quietness, the warmth, the beauty, the fragrance, the light, the solitude, the vastness of the scene, have placed me in an element with which earth has been scarcely connected. I have felt detached from all human and immediate interests. The presence of God has cheered my spirit, and united me to all the lofty objects of eternity. The love and grace of the great Saviour and benefactor have carried their ineffable consolations to my heart; and I have longed for the wings of a dove, that I might fly away and be for ever at rest. The next hour, the scene has been wholly changed. I have seen the multitude kiss the image which was that of Jupiter, and is that of St. Peter; I have heard the addresses to God in a language which the people cannot understand; I have considered the repugnance of the government to education; the jealousy with which the diffusion of the Scriptures is regarded; and all the previous enchantment has vanished from my mind. I have been compelled to turn from the magnificence of art, from the beauty of sculpture, from the lofty aspirations of an outward edifice, from the balmy breath of a fragrant atmosphere, from the fine emblems of heaven and eternity, to the appalling consideration, that the beams of truth have feebly irradiated these walls; that the chilliness of a moral death reigns eternally within them; that the very structure which had given the former enchantment to my senses and my heart, owes its existence to the ambition and despotism of human crime, and that in very truth, these magnificent buildings are, in the words of an energetic writer, 'as triumphal arches, erected in memorial of the extermination of that truth, which was given to be the light of the world and the life of men!' How fearful is the consideration, that all the best faculties of the mind and the hand have thus been seized by a foreign force, and made instrumental against the happiness of their possessors, and against the glory and authority of Him who called them into existence." "If," exclaims another writer, "we could imagine a momentary visit from Him, who once entered a fabric of sacred denomination with a scourge, because it was made the resort of a common traffic,—with what aspect and voice,—with what infliction, but the 'rebuke with flames of fire,' would he have entered this mart of iniquity, assuming the name of his sanctuary, where the traffic is in the delusions, crimes, and the souls of men. It was even as if, to use the prophet's language, the very 'stone cried out of the wall,' and the 'beam out of the timber answered it' in denunciation; for a portion of the means of building was obtained as the price of dispensations and pardons."

THE DOME.

—— The dome, the vast and wondrous dome,
To which Diana's marvel was a cell.

It is usually said to have been the boast of Michel Angelo that he would elevate the Pantheon in the air. "Whatever merit may attach to this idea, is certainly due to Bramante, since the cupola designed by him was certainly in pendentive, while that of Brunelleschi, at Florence, bears perpendicularly on its foundations. Perhaps to put it upon stilts would have been a more correct expression, and it is certainly better on the ground." "To be convinced of this," says Mr. Woods, "it is only necessary to mount into the gallery, and observe how much superior it appears in size and beauty than when seen from below."

The dome of St. Peter's is double,—that is to say, there are in fact two domes, an inner and an outer one; between the two is the staircase leading to the summit. The diameter of the internal dome is 140 feet, of the external dome, 195 feet. From the cornice immediately above the pillars to the aperture of the lantern the distance is 170 feet, from thence to the top of the cross, 110 feet; the height of the supporting piers themselves, is 178 feet, so that the total elevation of the top of the cross above the pavement of the church is 458 feet.

Much alarm has been felt at different times for the stability of the cupola of St. Peter's. Towards the end of the seventeenth century it was reported that the dome was about to give way, but on being examined it was found that there was no cause for reasonable alarm. In 1742 the report again prevailed; mathematicians and architects were called in, and gave conflicting opinions. There are now several bands of iron in the cupola; two were affixed when it was at first raised. There are cracks all round the drum, and according to Mr. Woods, they denote some enlargement in that part from the expansion of the dome. "But, in spite of all the iron ties, the cracks in the buttresses are the most important, and from their direction, almost uniformly outward and downward, indicate a settlement of the whole drum upon the pendentives, while the columns, resting upon the direct arches of the nave, have retained, or nearly retained, their position. The great piers have therefore probably gone outward, and when in the building, by bringing my eye carefully, so as to compare

the angle of a pilaster, not affected by this operation, with those of the central cupola, I think I can perceive that such an effect has taken place. Nor has the movement entirely ceased, since a dovetailed piece of marble, inserted to ascertain the fact in 1810, was found broken in 1825. Perhaps there never was any just ground of alarm; yet, as one of the iron circles, intended to contain the thrust had given way, there probably had been a considerable settlement, but not more than might have been expected, from the different periods in which the work had been carried up, and the repeated strengthenings which the solids had received. Nevertheless it was determined to insert five bands of iron, which were all let into the masonry, and made tight and sound under the direction of Vanvitelli. The broken chain was restored; but the other chain had been originally inserted in the thickness of the wall; this there was no opportunity for examining: in order to be perfectly secure, a sixth band was inserted in its neighbourhood, so that, in all probability, the dome and its drum are now secured by eight iron bands, five of which are in the drum, one at the springing of the arch, and two on the surface of the dome itself. It is doubted among the Italian architects whether the insertion of all these bands did not do more harm than any strength they could afford to the building can compensate." Dr. Burton says that the cupola of the Duomo, at Florence, has cracked even worse than that of St. Peter's; yet no iron bands have been inserted into that.

The ascent to the roof of St. Peter's is very easy. "You will stare," says a modern writer, "when I tell you that a broad paved road leads up to the top of St. Peter's, not, perhaps, practicable for carriages from its winding nature, but so excellent a bridle-road, that there is a continual passage of horses and mules upon it, which go up laden with stone and lime; and the ascent is so gentle, and the road so good, that any body might ride up and down with perfect safety." When the visiter reaches the leads on the roof, the immensity of the building appears very striking; "small houses and ranges of workshops for the labourers employed in the never ending repairs are built here, and are lost upon this immense leaden plain, as well as the eighteen cupolas of the side chapels which are not distinguishable from below." From this roof staircases lead to the ball, which is twenty-four feet in circumference, and is said to be capable of containing eighteen persons. From the balustrade on the outside of the ball, the adventurous sometimes mount to the bottom of the cross by an iron ladder, which is in part quite perpendicular.

ILLUMINATIONS OF ST. PETER'S.

It is the custom upon some occasions, and particularly on the eve of the festival of St. Peter, in the month of June, to light up the exterior of this enormous edifice. Simond gives a lively description of the scene and the preparations. "Soon after sunset the whole outside of St. Peter's was occupied, I might say, hung, with workmen, who were seen climbing in all directions, along the ribs of the dome, the lantern above it, the gilt globe, and the very cross at the top of all. The pediment in front, the architecture, the colossal statues, the very acanthus-leaves of the Corinthian capitals, swarmed with adventurous men, carrying lights, who, by means of ropes, slided and swung with great rapidity and ease from one point to another of the edifice, forcibly recalling to my mind the fireflies of America, on a hot Summer's evening. We understood that these men hear mass, confess, and receive the absolution before they begin, on account of the great risk they run of breaking their necks. The business being well organized, the whole surface of St. Peter's and the colonnade before it, soon shone with the mild effulgence of fifty thousand paper lanterns; but in less than an hour, and at a particular signal, a great change of scene took place; the whole edifice burst at once, as by magic, into absolute flames. This is done by means of pans full of pitch and pine shavings set on fire, and simultaneously thrust out from all parts of the edifice: the effect is quite wonderful, but of short duration. It was scarcely over before the crowd moved off towards the river, crossing the bridge, in order to occupy a situation in front of the castle of St. Angelo, and we did not without difficulty, reach the house on the top of which we had provided places. I certainly never saw fire-works at all comparable with these, for their inexhaustible variety,—their force, loudness, and duration. The huge mass of the castle seemed a volcano, pouring its ceaseless deluge of fire above, below, and all around; and the Tiber in front seemed itself a sheet of fire. Long after all this had ended, St. Peter's (forgotten for a while) continued to shed its mild lustre over the darkness of a cloudy night. The next day Rome appeared a desert, and the universal silence was only disturbed by the distant rattling of travelling carriages posting away to the north and to the south."

CHURCHES OF MODERN ROME.

It would far exceed our limits to describe even the principal of the many magnificent churches which, besides St. Peter's, are to be found in Rome; the whole number is said to be 365. We shall content ourselves with some remarks on their general style and appearance. One of the most remarkable of their characteristics is of a negative kind,—the almost total absence of the Gothic or pointed style of architecture; with the exception of a few fragments and a few ornaments in this style, nothing of it is to be seen. "The Roman architects," says Dr. Burton, "have invariably studied the Grecian models, and whatever fault may be found in separate parts, it must be allowed that the churches of this city present some of the most splendid specimens of architecture which can be found in modern times."

Forsyth says that they are admirable only in detail. "Their materials are rich, the workmanship exquisite, the orders all Greek. Every entablature is adjusted to the axis of each column, with a mathematical scrupulosity which is lost to the eye. One visionary line runs upward, bisecting, superstitiously, every shaft, triglyph, ovolo bead denticle, mutile modillon, or lion's mouth, that lies in its way. But how are those orders employed? In false fronts which, rising into two stages of columns, promise two stories within—in pediments under pediments, and in segments of pediments—in cornices, for ever broken by projections projecting from projections—in columns, and pilasters, and fractions of pilasters, grouped round one pillar. Thus Grecian beauties are clustered by Goths: thus capitals and bases are coupled, or crushed, or confounded, on each other; and shafts rise from the same level to different heights, some to the architrave, and some only to the imposts. Ornaments for ever interrupt or conceal ornaments: accessories are multiplied till they absorb the principal: the universal fault is the too many and the too much. Few churches in the city show more than their fronts externally. Their rude sides are generally screened by contiguous buildings, and their tiled roof by a false pediment, which, rising to an immoderate height above the ridge, leads you to certain disappointment when you enter. Every front should be true to the interior. Such was the front of the ancient temples, a pediment resting on a peristyle and forming a fine pentagon: but such a figure would be too flat for those vaulted churches, and incompatible with their aisles.....The Romans seem fondest of those fronts where most columns can be stuck and most angles projected. Some, as Santa Maria in Portico, the Propaganda Fide, &c., are bent out and in like brackets. Quadrangular fronts, like those of St. Peter's, the Lateran, &c., are fitter for a palace than for a church. How specifically truer is the old Gothic front, which admits but one large window, similar in form to the front itself!"

"The principal churches of Rome," says the same writer, "however different their style of building and ornament may be, are distributed in the same manner. Their aisles are generally formed by arcades: over these are sometimes grated recesses, but never open galleries. The choir terminates in a curve, which is the grand field of decoration, and loaded with curiosities and glories in brass and marble. The high altar stands in the middle of the cross. The chapels of the Holy Sacrament and of the Virgin are usually in the transepts. Those of the saints are ranged on the sides; and each being raised by a different family, has an architecture of its own, at variance with the church, which thus loses its unity amid nests of polytheism."

Among the churches of modern Rome there are seven which are called basilicas, and are supposed to possess a peculiar sanctity. The name *basilica* is derived from the circumstance of their being generally formed out of the *basilicæ* of ancient Rome, which have been already mentioned. These seven are St. Peter's, Sta. Maria Maggiore, St. John Lateran, and Sta. Croce in Gerusalemme,—which are within the walls,—and St. Paul's, S. Lorenzo, and St. Sebastian's, which are without them. The reason assigned for the preference is the following. Upon a certain occasion the four patriarchs of Alexandria, Antioch, Jerusalem, and Constantinople, came to Rome; and four principal churches were assigned to them during their

residence. These were St. Paul's, Sta. Maria Maggiore, S. Lorenzo, and St. Peter's. The pope, who was superior to them all, reserved for himself St. John Lateran, which was then, and is still, higher in rank than St. Peter's, being in fact, the metropolitan church of Rome, and "the principal temple of the Catholic world," as Vasi says. This circumstance imparted a peculiar sanctity to the five churches, and the people frequented them more than any others. St. Sebastian and Sta. Croce were subsequently added to the number, because in going from St. Paul's to the Lateran, it was necessary to pass by St. Sebastian, and in continuing the visitation from the Lateran to S. Lorenzo, Sta. Croce had the like good fortune to be in the way. "Such," says Dr. Burton, "is the reason assigned by an antiquary and dignitary of the Romish church, which, perhaps will not seem very satisfactory."

RELICS OF PAGANISM IN MODERN ROME.

MIDDLETON, in his celebrated *Letter from Rome*, after expressing the resolution which he had taken to employ himself, during his stay in the capital, chiefly in observing its antiquities, and to lose as little time as possible in taking notice of the fopperies and ridiculous ceremonies of the present religion of the place, goes on to say, "But I soon found myself mistaken; for the whole form and outward dress of their worship seemed so grossly idolatrous and extravagant beyond what I had imagined, and made so strong an impression on me, that I could not help considering it with a particular regard; especially when the very reason which I thought would have hindered me from taking any notice of it at all, was the chief cause which engaged me to pay so much attention to it: for nothing, I found, concurred so much with my original intention of conversing with the ancients; or so much helped my imagination, to fancy myself wandering about in *old heathen Rome*, as to observe and attend to their religious worship; all whose ceremonies appeared plainly to have been copied from the *rituals of primitive paganism;* as if handed down by an uninterrupted succession from the *priests of old* to the *priests of new Rome;* whilst each of them readily explained and called to my mind some passage of a classic author, where the same ceremony was described as transacted in the same form and manner, and in the same place where I now saw it executed before my eyes: so that as oft as I was present at any religious exercise in their churches, it was more natural to fancy myself looking on at some solemn act of idolatry in old Rome, than assisting at a worship instituted on the principles and framed upon the plan of Christianity."

"Many of our divines," he adds, "have, I know, with much learning and solid reasoning charged and effectually proved the *Crime of Idolatry* on the Church of Rome; but their controversies, (in which there is still something plausible to be said on the other side, and when the charge is constantly denied, and with much subtilty evaded,) are not capable of giving that conviction which I immediately received from my senses; the surest witnesses of fact in all cases; and which no man can fail to be furnished with who sees *popery* as it is exercised in Italy, in the full pomp and display of its pageantry; and practising all its arts and powers without caution or reserve. The similitude of the popish and pagan religion seemed so evident and clear, and struck my imagination so forcibly, that I soon resolved to give myself the trouble of searching to the bottom; and to explain and demonstrate the certainty of it, by comparing together the principal and most obvious parts of each worship." He then expresses an opinion that he shall have matter enough to tire both himself and his correspondent, "in showing the source and origin of the popish ceremonies, and the exact conformity of them with those of their pagan ancestors." We select his remarks on the use of incense:—

"The very first thing that a stranger must necessarily take notice of, as soon as he enters their churches, is the use of *incense* or *perfumes* in their *religious offices;* the first step which he takes within the door will be sure to make him sensible of it, by the offence that he will immediately receive from the smell as well as smoke of this *incense*, with which the whole church continues to be filled for some time after every solemn service,—a custom received directly from *paganism;* and which presently called to my mind the old descriptions of the *heathen temples* and *altars* which are seldom or never mentioned by the antients without the epithet of *perfumed* or *incensed.*

"In some of the principal churches, where you have before you in one view, a *great number of altars*, and all of them smoking at once with *steams of incense*, how natural is it to imagine oneself transported into the *temple of some heathen divinity*, or that of the *Paphian Venus* described by Virgil?

> Her hundred altars there with garlands crown'd,
> And richest incense smoking, breathe around
> Sweet odours," &c.

Under the *pagan emperors*, the use of incense for the purpose of religion was thought so contrary to the obligations of *Christianity*, that in their persecutions the very method of *trying and convicting a Christian was by requiring him only to throw the least grain of it into the censer, or on the altar.*

Under the *Christian emperors*, on the other hand, it was looked upon as a *rite* so peculiarly *heathenish*, that the very *places or houses* where it could be proved to have been done, were by a *law* of Theodosius *confiscated to the government.*

The Rev. Mr. Blunt, in his *Vestiges of Ancient Manners and Customs, &c.*, points out several marks of resemblance between the ancient and the modern superstition. Not the least curious is the analogy which may be observed between the names of the pagan temples of Ancient Rome, and the Catholic churches of Modern Rome. Of temples, there are said to have been formerly in Rome four hundred and twenty sacred to the pagan gods; of churches there are now in the modern city and its suburbs, upwards of a hundred and fifty sacred to Christian saints. "And as heretofore many temples," to use the words of Mr. Blunt, "were consecrated to the same deity under different titles, so now are there many churches devoted to the same saint, or to the Madonna, distinguished only by a diversity of epithets." Thus in Ancient Rome, there was a temple of Jupiter Castor, of Jupiter Feretrius, of Jupiter Sponsor, of Jupiter Stator, of Jupiter Tonans, of Jupiter Victor, &c., of Venus Calva, Venus Capitolina, Venus Erycina, Venus Cloacina, Venus Victrix. So in Modern Rome we find a church of Santa Maria degli Angeli, Santa Maria di Araceli, Santa Maria Imperatrice, Santa Maria Liberatrice, Santa Maria della Consolazione, Santa Maria Egyptiaca, Santa Maria dell' Anima, &c.; S. Pietro in Vaticano, S. Pietro in Montorio, S. Pietro in Vincoli, S. Pietro in Carcere, &c. Again, the heathen temples were often dedicated to two divinities, as to Castor and Pollux, to Venus and Cupid, to Venus and Rome, to Honour and Virtue, to Isis and Serapis, &c. In like manner, there are now churches to SS. Marcellinus and Peter, to Jesus and Maria, to Dominicus and Sistus, to Celsus and Julianus, to SS. Vincentius and Anastasius. Upon this same point we refer the reader to the remarks which we quoted from Middleton's *Letter*, in our description of the Pantheon, which from being formerly dedicated to all the gods of pagan Rome, is now dedicated to all the saints of Catholic Rome.

Mr. Matthews remarks, that some traces of the old heathen superstitions are constantly peeping out from under their Catholic disguises. "What is the modern worshipping of saints and images but a revival of the old adoration paid to heroes and demi-gods;—or what the nuns, with their vows of celibacy, but a new edition of the vestal virgins? Wherever we turn, indeed, 'all is old, and nothing new.' Instead of tutelary gods, we find patron saints and guardian angels, and the *canonization* of a saint, is but another term for the *apothcosis* of a hero..... The very same piece of brass which the old Romans adored, now with a new head on its shoulders,—like an old friend with a new face,—is worshipped with equal devotion by the modern Italian.

"It is really surprising to see with what apparent fervour of devotion, all ranks, and ages, and sexes, kneel to, and kiss, the toe of this brazen image. They rub it against their foreheads, and press it against their lips, with the most reverential piety. I have sat by the hour to see the crowds of people who flock in to perform this ceremony,—waiting for their turn to kiss;—and yet the Catholic would laugh at the pious Mussulman who performs a pilgrimage to Mecca to wash the holy pavement, and kiss the black stone of the Caaba;—which, like his own St. Peter, is also a relic of heathenism."

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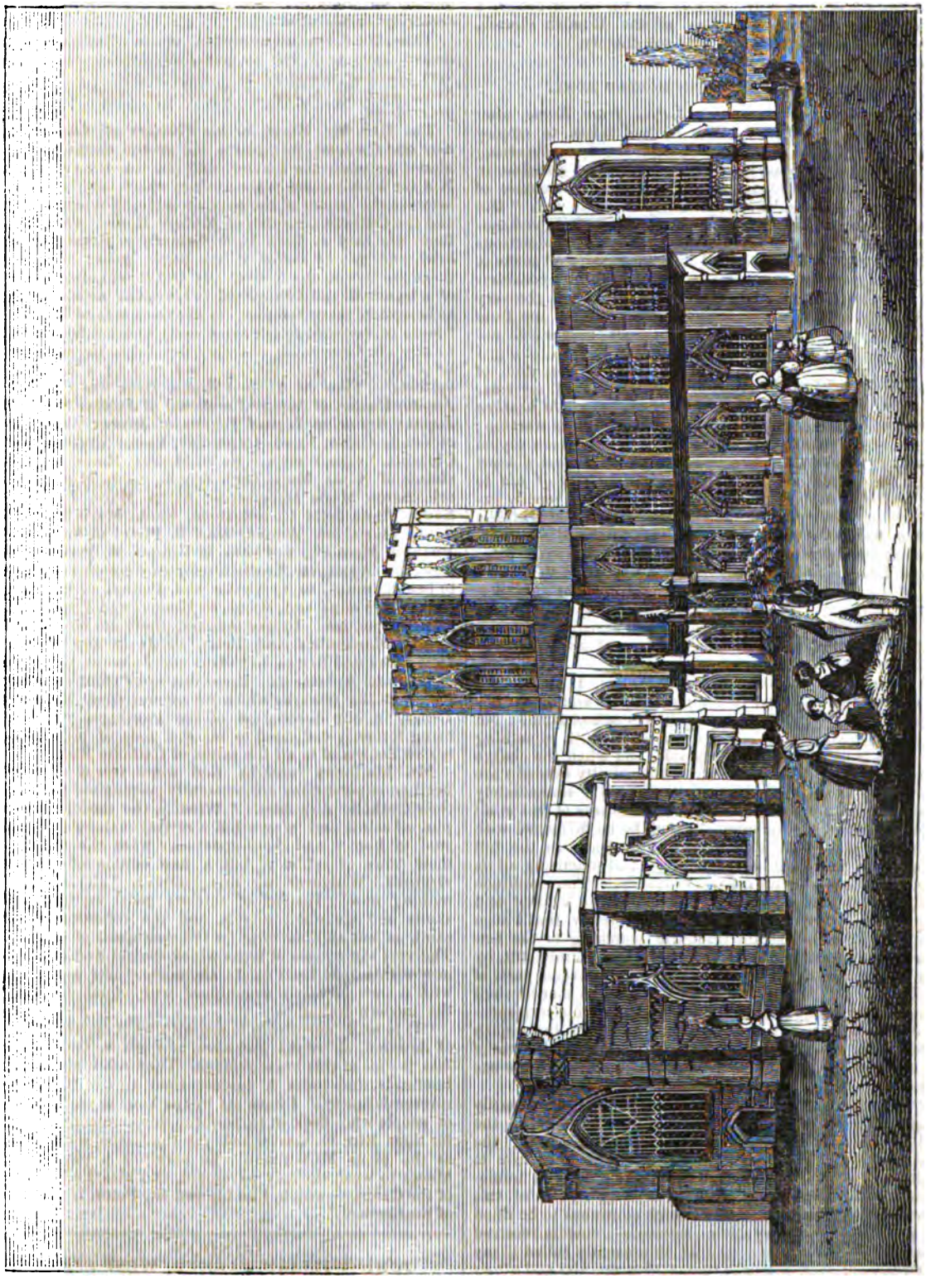


CHESTER CATHEDRAL.

CHESTER CATHEDRAL.

IN the old edition of *Britain*, by Camden, of the date of 1610, is the following spirited passage relative to this Cathedral:—

About the year of our Redemption, 1094, when, as in a devout and religious emulation, princes strove that cathedral churches and minsters should be erected in a more decent and seemly form; and when Christendom roused, as it were, herself, and casting away her old habiliments, did put on everywhere the bright and white robe of the churches, Hugh, the first of the Norman blood that was Earl of Chester, repaired the church which Earl Leofric had formerly founded in honour of the Virgin, St. Werburga; and, by the advice of Anselm, whom he had procured to come out of Normandy, granted the same unto monks. And now it is notorious for the tomb of Henry the Fourth, emperor of Almaine*, who, as they say, gave over his empire, and lived here an eremite's† life, and for the Bishop's See therein established; which See, immediately after the Norman Conquest, Peter, Bishop of Lichfield, translated from Lichfield hither; but when it was brought to Coventry, and from thence into the ancient seat again, West Chester‡ lay a long time bereft of this episcopal dignity, until, in our father's days, King Henry the Eighth, having thrust out the monks, ordained prebendaries and restored a bishop again, under whom, for his diocese, he appointed this county, Lancashire, Richmond, &c., and appointed the same to be within the province of York. At its first foundation it was in the province of Canterbury.

Camden having supplied us with this concise history of the See of Chester, we may proceed to give some description of the fabric. The Cathedral consists of the following parts; a nave and choir, separated from their respective aisles by clustered columns; a central tower, resting on four massive piers; transepts; and a lady-chapel to the east. The western entrance is by a pointed doorway, from which two descents by steps lead into the nave. On one side is the Bishop's consistory court, on the other an entrance to the Bishop's palace. These were intended to have formed the bases of two western towers, and the foundation of them was laid with much ceremony by Abbot Birchenshaw in 1508. The south porch of the church is in the style of the same period. The transepts are of very unequal proportions, being uniform neither in size nor appearance. The north transept has an ornamented oak roof, supported by angels, bearing emblems of the crucifixion. At the south-east angle of this transept is an ancient vestry. The south transept, which is by far the larger of the two, is used as the parish-church of St. Oswald. In the Choir, opposite to the pulpit, is the stone case which formerly surrounded the shrine of St. Werburgh, now shortened, and used as the bishop's throne. It exhibits a rich specimen of Gothic architecture, in the style of the early part of the fourteenth century. Under the east window of the Choir is an arch, opening to the Lady-chapel.

The Cloisters, the general style of which is that of the fifteenth century, are situated on the north side of the nave, and form a quadrangle of about 110 feet square; the centre formerly contained a cistern for water, which was brought in pipes from Christleton. These cloisters originally consisted of four vaulted walks, of which the south walk is destroyed. In the church-wall, in the south walk, are six semicircular arches, resting on short pillars; the three eastern ones have ornamented pillars; these mark the places of burial of the Norman abbots. The west walk opens to the nave by an early Norman arch at the south end; and by another, now closed, it formerly opened to a passage leading to the great square of conventual buildings. Another doorway, opposite to the south walk, closed by a pillar placed before it to support the present vaulting, led to an arched passage, forming the abbot's way to the church. Along the rest of this walk extends a kind of crypt, consisting of a double row of circular arches. The north walk contained the chief entrance into the refectory of the convent, under a rich semicircular arch; and at the east end was a doorway leading to the kitchen and its offices, and to the staircase of the dormitory. Along the greater part of the north side ran the refectory, a noble apartment, ninety-eight feet in length and thirty-four in height, with a roof of oak, resting on brackets, which was removed in 1804. The Chapter-house, the entrance to which is from the east side of the cloister, extends eastward, parallel with the choir of the church. Some portions of this interesting cathedral are assigned to the eleventh century. The north aisle of the choir, the chapter-house, and the ancient refectory, are said to belong to the early part of the thirteenth century. The central tower is stated to have been finished in 1210.

The length of the Cathedral from east to west, is three hundred and forty-eight feet; the width of the Choir and Nave is seventy-four feet six inches.

Chester Cathedral suffered great injury during the civil wars, and continued in a very dilapidated state till 1656. At the time the unfortunate Duke of Monmouth was in the city, the mob forced the doors, and destroyed most of the painted glass: they also injured the font, and some of the monuments, and committed several other outrages.

Before the Reformation this church was governed by abbots, of whom John Clarke, elected about 1537, may be reckoned the twenty-seventh abbot. Little more is known of him, than that he readily complied with the wishes of King Henry the Eighth in surrendering the monastery at the dissolution, in consideration of which he was suffered to retain the government of the dissolved abbey, under the character of dean of the new cathedral.

The diocese of Chester is of great extent; but, in pursuance of the regulations recommended by the Ecclesiastical Commissioners, it will be relieved of a large portion of territory. The deaneries of Richmond, Catterick, and Boroughbridge, and part of the deanery of Kirkby Lonsdale, have been taken out of it, to constitute the greater part of the see of Ripon. It is also to lose the whole of the county of Lancaster, which, with the exception of the deanery of Furness, will go to form the see of Manchester; this latter deanery being assigned to the diocese of Carlisle. The archdeaconry of Salop, from the diocese of Lichfield, is, however, to be added to Chester.

Among the most eminent of the bishops of Chester, since the foundation of the episcopate by King Henry the Eighth, may be mentioned the following.

BRIAN WALTON, D.D., Cambridge, the editor of the great Polyglott Bible, was born at Cleveland, in Yorkshire, in 1600. He became rector of St. Martin Orgars, in the city of London, and in 1635 was appointed to the living of St. Giles'-in-the-Fields. He was a learned divine and an excellent lawyer; but, being true to the church and king, he was obliged, on the breaking out of the civil war, to quit his preferment for fear of being murdered. Having fled to Oxford, he was incorporated of that University, and soon formed his noble project of preparing the Polyglott Bible, which, however, was finished during the Commonwealth, at the house of Dr. Fuller, his father-in-law, in London. This

* *Germany.* † *Hermit's*, from a Greek word signifying a desert.
‡ Chester received its name from *Castra*, the Latin word for a camp; the Roman legions having frequently encamped in this neighbourhood, and particularly the famous *twentieth* legion, called the *victorious*, which was placed here by Galba. Chester was often called *West Chester*, from its western situation in the county.

splendid work, which, while it reflected honour upon its learned editor and his coadjutors, was also a credit to the English press, was published in 1657, in six volumes folio, the sacred text being printed in the Hebrew, Syriac, Chaldee, Samaritan, Arabic, Æthiopic, Persian, Greek, and Latin languages. The preface, which was originally intended for Cromwell, and contained allusions to the Protector, was altered to suit the new reign. The *republican* copies are far more scarce than the *royal;* but the possessor of either edition may be proud of owning such a treasure. In September, 1661, Walton was presented to the bishopric of Chester, and on the 11th of that month was installed with great ceremony; "A day," says Wood, "not to be forgotten by all the true sons of the Church of England." But his honours were short-lived; he died in Aldersgate-street, London, in the November following, and was buried in St. Paul's Cathedral.

John Wilkins, D.D., Oxford, was the son of a goldsmith, and was born in 1614, at Fawsley, near Daventry. Having taken orders, he became chaplain to Lord Say, and then to Charles, Count Palatine of the Rhine. Upon the breaking out of the civil war he joined the parliament, and took the oath of the solemn League and Covenant. The committee of parliament for reforming the University made him warden of Wadham. He afterwards married Mrs. French, a widow, sister of Oliver Cromwell; and though ejected at the Restoration from the mastership of Trinity College, Cambridge, to which he had been appointed in 1659 by Richard Cromwell, he soon became preacher at Gray's Inn, and rector of St. Lawrence, Jewry. About this time he was chosen one of the council of the Royal Society, and, in consequence of his great mathematical and scientific attainments, proved a highly valuable member of that distinguished body. He soon rose to be Dean of Ripon, and subsequently Bishop of Chester, the latter elevation being secured for him by the interest of Villiers, Duke of Buckingham, whose patronage was not considered creditable to him. He died at the house of Dr. Tillotson, in Chancery-lane, London, in 1672. Wilkins's works are very ingenious, and some of them more entertaining than useful. When twenty-five years of age he published a whimsical little book, entitled "*The Discovery of a New World*; or a discourse tending to prove, that there may be another habitable world in the moon, with a discourse concerning the possibility of a passage thither." He was the inventor of the Perambulator, or Measuring-Wheel. Of his theological works the principal was his *Discourse on Natural Religion,* published after his death by Tillotson.

John Pearson, D.D., Cambridge, "in all respects the greatest divine of his day*," celebrated for his admirable *Exposition of the Creed,* was born at Snoring, in Norfolk, in 1612. From Eton school, he proceeded to King's College, Cambridge, and took orders in 1639. Having been chaplain to Finch, Lord Keeper of the Great Seal, he was presented to the living of Torrington, Suffolk. In 1650 he was made minister of St. Clement's, Eastcheap, London, where he preached the substance of his *Exposition of the Creed.* This noble work has gone through many editions: it is in itself a body of divinity, deep, clear, and accurate, and may well be consulted by the general reader, as well as by the student of theology; to the latter it is indispensable. Having passed through various stages of preferment, Pearson succeeded Dr. Wilkins in the see of Chester in 1673. He died at Chester in 1686. Dr. Bentley, the famous scholar and critic, used to say, that Bishop Pearson's "very dross was gold."

* Bishop Burnet.

Sir William Dawes, Bart., D.D., Oxford and Cambridge, a most excellent person, was born in 1671, and received his early instruction at Merchant Tailors' School, from whence he obtained a Scholarship, and afterwards a Fellowship, at St. John's College, Oxford. But his father's title and estate descending to him, he settled at Catherine Hall, Cambridge, of which college, after taking orders, and obtaining his Doctor's Degree, he was appointed Master. Through his interest with Queen Anne, he obtained an act of parliament for annexing a Prebend of Norwich to the Mastership of Catherine Hall for ever. As Rector and Dean of Bocking he discharged his duties in a very exemplary manner. He was afterwards appointed Bishop of Chester, and translated to the Archbishopric of York. He died in 1724, at the age of 53, respected and beloved by persons of all parties. In addition to more sterling qualities, he is described as having been a man of peculiarly fine person, and mild, agreeable manners, to whom honour came, as it were, naturally, and on whom it sat admirably well.

Francis Gastrell, D.D., Oxford, was born in Northamptonshire, about 1662, and having been brought up at Westminster school, was elected on the foundation of Christchurch, Oxford. In 1694 he became preacher at Lincoln's Inn, and on being chosen to preach the Boyle's lecture in 1697, powerfully maintained the truths of Christianity against the cavils of the deists. In 1707 he preached an admirable sermon in the church of St. Sepulchre, on the occasion of the grand Anniversary Meeting of the Charity Schools, before the Society for Promoting Christian Knowledge; and in the same year, he put forth his excellent work, entitled "*The Christian Institutes,* or the sincere word of God digested under proper heads, and delivered in the words of Scripture." On his promotion to the Bishopric of Chester, he resigned the preachership of Lincoln's Inn. Bishop Gastrell died in 1725, and was buried in the Cathedral of Christchurch, Oxford.

Beilby Porteus, D.D., Cambridge, may be cited as another ornament of the see of Chester. He was one of nineteen children, and born at York, in 1731, of American parents, who had settled in this country. He was placed at a school at Ripon, and entered at Christ's College, Cambridge, at an early age. Having distinguished himself by his degree, and other academical honours, he became fellow of his college, and, for a short time, held the office of esquire Bedell. He was twenty-six years old on taking orders, and thirty-one when he was appointed domestic Chaplain to Archbishop Secker. The posts which he successively occupied in the church were well and ably filled by him. These were, the rectory of Lambeth, the bishopric of Chester, and, lastly, the bishopric of London. He was a persuasive and energetic preacher, his sermons being so attractive as to occasion great crowds of persons of all classes to attend the church where it was understood he would preach. He died in 1809, in the 79th year of his age, and was buried in a vault in the churchyard of Sundridge, Kent, where a neat monument has been erected to his memory.

We may justly insert in this distinguished list the name of Dr. C. J. Blomfield, Cambridge, who, after having been for some years the rector of an important parish in the metropolis, succeeded to the laborious charge of the diocese of Chester, and is now Bishop of London.

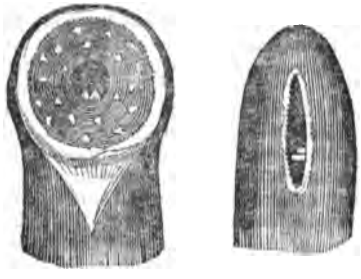
The see of Chester is at present filled by Dr. J. B. Sumner, also of Cambridge, a prelate, whose high character entitles him to a respectful mention in this short notice.

THE LAMPREY.

THE SEA-LAMPREY. (*Petromyzon marinus.*)

THE Lamprey tribe constitutes the last family of the fishes with a cartilagenous skeleton. There are four known British species; that figured above, which is found in salt-water, and three inhabitants of fresh water,—namely, the Lampern, *Petromyzon fluviatilis;* the Fringe-lipped Lampern, *Petromyzon planeri;* and the Sand-Pride or Mud-Lamprey, *Ammocœtes branchialis.* The Sea-Lamprey is found in all the seas of Europe, from the Mediterranean as far north as Scandinavia and Iceland; it is also met with in North America. In Spring and Summer this species frequents the mouths of most of our rivers, and ascends the stream for a considerable distance, for the purpose of depositing its spawn. Sir William Jardine says, speaking of the Scotch rivers, "They ascend our rivers to breed about the end of June, and remain until the beginning of August." They are not furnished with any elongation of the jaw, afforded to most of our fresh-water fish, with which the latter form the receiving furrows at this important season; but the want is supplied by their sucker-like mouth, by which they individually remove stones or other substances. Their power is immense; stones of a large size are removed by them, and a large furrow soon formed. This species remains in pairs, two in each spawning-place, and while there employed, retain themselves affixed to a large stone.

The right-hand figure below shows the flexible lip, concealing the mouth; the figure on the left hand represents the rounded mouth, the small and numerous tubercular teeth, and the central opening leading to the throat and stomach.



The Lampreys, like the sharks and rays, have no swimming-bladder, and being also without pectoral fins, are usually found near the bottom of the water. To save themselves from the constant muscular exertion which is necessary to prevent their being carried along by the current, they attach themselves by the mouth to stones or rocks, and from this circumstance they obtained the name of *Petromyzon*, Stone-sucker.

The food of the Lamprey consists generally of any soft animal matter; and in the sea it is known to attack fishes even of large size, by fastening upon them, and with its numerous small, rasp-like teeth, eating away the soft parts down to the very bone.

The Marine Lamprey usually measures from twenty to twenty-eight inches in length. In slowly-running water, the Lamprey swims with a lateral undulating motion of the body, assisted by its fins; where the current is rapid, it makes successive plunges forward, attaching itself quickly to any fixed substance that offers, to secure the advantage gained.

Pennant states that it has been an old custom, for the city of Gloucester annually to present the sovereign with a lamprey-pie, covered with a raised crust.

The Fresh-water Lampern is about half the size of the species just described, and is believed to remain in the rivers it frequents throughout the whole year. It is considered in best condition from October to March. Formerly it was in great request among the Dutch fishermen, as bait for turbot, cod, &c.; but the great demand so raised the price by making the fish scarce, that other substances have been resorted to. In the course of one season as many as 400,000 have been sold for bait, at 40*s.* per 1000. Formerly the Thames alone supplied from 1,000,000 to 12,000,000 Lamperns annually.

THE USEFUL ARTS. No. XXXV.

THE CARPENTER.

FOLLOWING the plan we have laid down, we shall first describe the principal materials made use of, by this most important of all mechanics. It is obvious that in every country the timber is employed that is either indigenous, and adapted to the work to be done, or which can be procured most readily from other countries. In Britain the first and most important of all trees is, of course, our own OAK, of which we have two species and several varieties, belonging to the genus *Quercus.* It is far less used in civil architecture than formerly, although there are certain purposes in building to which it is still applied: but owing to its value, and the demand for it for ships, and to the great labour required to work it, its place is now supplied by fir. The best oak is that which grows on cold, stiff, clayey soils, and is the slowest in arriving at maturity; and the colder the climate, or the higher above the level of the sea the tree grows, provided it be not stunted from severity of climate, the better the timber; hence Scottish and Welsh oak is more esteemed than that from the middle or southern counties of Britain. Our own island does not produce this timber in sufficient abundance to supply the demand, and large quantities of oak are imported from different countries, especially from Prussia and Canada. There are four kinds of oak used in the Royal Dock-yards, Welsh, Sussex, Adriatic, and Baltic, besides two others termed African oak, employed in different parts of the vessels, according to the qualities requisite for the particular purpose. Next to our own oak, that from the shores of the Baltic is by far the most esteemed.

In domestic architecture oak is only used in the largest and best buildings, occasionally for the principal beams; but its chief use is for door and window frames, cills, sleepers, king-posts of roofs, for trussing fir girders, for sashes, for gates of locks, sluices, posts, piles, &c. The timber called *African oak*, used in the navy, is wood of a different genus.

TEAK is the produce of a tree of the genus *Tectona.* Valuable as teak is found to be in ship-building, it has not yet been used in domestic building to any extent. From sixteen to eighteen thousand loads of teak are annually imported into Britain from India, principally for the Royal Dock-yards, this wood being used for certain beams and pillars in ships.

WAINSCOT is the wood of a species of oak, imported from Russia and Prussia in a particular form of log

FIR, or PINE, ranks next to oak for its valuable qualities, and if its universal application be taken into consideration, it might be thought even superior in importance. The finest fir is that from Norway, Sweden, Russia, and the Baltic generally, the vast mountainous tracks of which countries are covered with dense forests of various species of pine. The best of these is the *Pinus sylvestris*, called also in Britain the *Scotch Fir*, from its growing in great perfection in the northern portion of our island. The fir from the southern shores of the Baltic, the timber from which is known as Memel, Riga, or Dantzic fir, from the several

localities whence it is imported, is next in value to that from Norway. Large quantities of fir timber are also annually brought from Canada, but this timber is greatly inferior to the European.

Deal is the name given to the timber of the pine, when sawed into planks, in which form it is imported into this country from the north of Europe. Deal is the produce of the *Pinus abies*, *Pinus alba*, and *Pinus nigra*, and the best is that obtained from Christiana.

Fir timber is used for every part of houses, and extensively in ship-building, in the fittings-up, while it constitutes the only material for masts, for which purpose its lightness, and the great length and straightness of the trunk, peculiarly fit it.

Pine, or fir, is imported into this kingdom under the various names of timber, battens, deals, laths, masts, yards, and spars, according to the size or form into which the tree is sawed. It is called *timber* when the tree is only squared into a straight beam of the length of the trunk, and from not less than eight or nine inches square, up to sixteen or eighteen square; fifty cubic feet is a load of timber. Deals vary in length and thickness from eight to sixteen feet, eleven inches wide, and from one and a half to three and a half inches thick. Four hundred superficial feet of one and a half inch plank makes a load. *Battens* are small long pieces of fir about three inches wide and one inch thick. Masts, yards, and spars, are the trunks of small trees simply barked and topped.

Beech is partially employed in ship-building for the keel and timbers near it; but it is not at all employed in civil architecture. The principal use made of this wood is in the construction of machines, mill-work, lock-gates, &c., and for handles to tools; it is also a good wood for the turner, being of a close grain. It will not, however, bear alternations of moisture and dryness, and is liable to be attacked by worms, so that it is not extensively employed.

Chestnut belongs to the same order as the beech, but although a valuable wood, it is now little, if ever, used. Formerly it was extensively so, and the roofs of several ancient buildings are constructed of it. From some experiments, indeed, it seems to be as durable as oak itself.

Ash is the wood for the wheelwright and the maker of agricultural implements; it is one of the most valuable of all timber trees, combining great strength with elasticity and lightness; it, however, splits easily. Ash is not used either by the shipwright or the common carpenter.

Elm is a coarse-grained wood, but strong and durable; it does not work readily, and is therefore but little used. It is, however, employed for certain parts of ships, and for making casks, chests, coffins, posts for mill-work, and a few other purposes.

Next to oak and fir, the foreign wood Mahogany is by far the most valuable, and that most extensively used; it is the growth of the West Indies and South America, and the tree, the *Swietenia mahogani*, is, perhaps, the most majestic of all timber-trees for the enormous dimensions its trunk attains, its vast height and size, and its dark beautiful foliage. The mahogany of the island of Cuba, and that from the bay of Honduras, is first in estimation. There are two East Indian species, but they are not imported in any quantities into this country.

The best mahogany is that which grows in dry, cold, and exposed situations. Such wood is fine-grained, hard, and dark in colour, richly variegated, causing it from its beauty to rank among the most ornamental of fancy woods, while the light, coarse-grained wood, which grows in warm moist climates is sufficiently abundant to be used for ordinary purposes, and yet possesses admirable properties for all, where no great strength or tenacity is wanted.

Within the last twenty years the use of this wood has increased amazingly, and some ships have many of their upper timbers above the water-line constructed of Honduras mahogany. Its use in furniture and cabinet-making is well known, and, indeed, it may be said to be the principal wood used for this purpose, and to have entirely supplanted our own walnut, which was formerly in universal use for the same purposes.

The woods above enumerated are those most extensively or largely used by the carpenter; but there are several others employed for small articles, and for particular purposes, which deserve mentioning.

Box is the wood of the *Buxus sempervirens*, a hardy evergreen plant, indigenous in all the southern parts of Europe and Western Asia, and long domesticated in our shrubberies. Box is especially the wood for turning, it being closer-grained, denser, and tougher than perhaps all others, except iron-wood, Lignum Vitæ, and one or two rarer woods. Box is used for rules, scales, and for small cabinet works; but that which gives it particular importance is its universal use for wood engraving.

Lance is the name given to the wood of the *Guatteria virgata*, a tree indigenous to Jamaica, and one of the most important that are so, from the valuable qualities of its timber, lance-wood far exceeding our ash in lightness, strength, and elasticity; hence it is admirably calculated for shafts to carriages, handles to spears, and for all purposes where straight, light, flexible, and tough wood is required. It is neither so close-grained as box nor so hard, but it turns well, and does not split; in colour it is lighter than box.

Ebony is the name given to the wood of several different trees, which agree in being dark-coloured, dense, and durable; it is used for inlaying and for making rules or scales, as not being liable to warp. It is an excellent wood for turning, but except for these purposes, it is less in request now than formerly, when it was much used in cabinet-making.

Lignum Vitæ is the wood of the *Guaiacum officinale*, a large tree indigenous in the West Indies. This wood is the hardest and heaviest known, and can only be worked in the lathe. It is much used for making the *sheaves*, or pullies of blocks used in shipping, and for friction rollers, &c.

There are a variety of foreign woods which, from their beautiful grain and varied tints, are used in cabinet-making. But as these woods are too valuable to be used solid, they are sawed into thin leaves, called *veneers*, which are glued down on a backing of ordinary mahogany. The principal of these fancy woods are—

Rose-wood, which is produced by a tree, a native of Brazil. This wood is much used for furniture, both as a veneer, and solid for legs of tables, chairs, &c.

King-wood is also the produce of Brazil; it is a dark chocolate wood, veined with fine black veins.

Beef-wood comes from New Holland, is of a pale red even tint, and intensely hard and heavy. It is used for inlaying and bordering.

Tulip-wood is a wood of a clouded red and yellow colour, and very hard, and used for bordering to larger woods. The tree is unknown to our botanists.

Zebra-wood is a large-sized tree, and abundant enough to be used as a veneer in large furniture, like rose-wood; it is more curious than elegant.

Satin-wood is well known for its glossy yellowish tint, from which it derives its name; there are two varieties.

Maple, from our own indigenous tree, is a very elegant wood of a light colour, or else, near the root, variegated with knots and twisted grain. It is much used in fancy-work.

Of the great number to whom it has been my painful professional duty to have administered in the last hour of their lives, I have sometimes felt surprised that so few have appeared reluctant to go to the undiscovered country "from whose bourne no traveller returns!" Many, we may easily suppose, have manifested this willingness to die from an impatience of suffering, or from that passive indifference which is sometimes the result of debility and bodily exhaustion. But I have seen those who have arrived at a fearless contemplation of the future, from faith in the doctrine which our religion teaches. Such men were not only calm and supported, but cheerful, in the hour of death; and I never quitted such a sick chamber without a hope that my last end might be like theirs.—Sir Henry Halford.

We know, and what is better we feel, inwardly, that religion is the basis of civil society, and the source of all good and of all comfort. We know, and it is our pride to know, that man is by his constitution a religious animal; that atheism is against not only our reason, but our instincts, and that it cannot prevail long. But if in the moment of rest, and in a drunken delirium from the hot spirit drawn out of the alembick of hell, (which, in France, is now so furiously boiling,) we should uncover our nakedness, by throwing off that Christian religion, which has hitherto been our boast and comfort, and one great source of civilization among us, and among many other nations, we are apprehensive (being well aware that the mind will not endure a veil) that some uncouth, pernicious, and degrading superstition might take place of it.—Burke.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT.

No. IV.

LINEN-INSPECTORS — BANK-NOTE INSPECTORS — BURNISHERS — PAINTERS — MINERS AND COLLIERS—EFFECT OF HEAT UPON THE EYE-SIGHT —CASTING OF STEEL—BURNING OF PAINTED GLASS.

WE now proceed to notice a few employments wherein too much or too little light proves injurious to the eye.

It is of course known that the value of cloth depends upon the fineness of its material, and the degree of closeness with which it is put together. In the process of weaving, the threads, whether of silk, cotton, or wool, &c., cross each other at right angles, and constitute what is technically termed the warp and the woof. The value of the cloth therefore is tested by the number of threads contained within a given space—the larger the number, the more valuable becomes the article. There is a class of persons called *linen-inspectors*, whose business it is to test the value of cloths in this way, and such persons suffer loss of visual power, in consequence of the constant application of the eye to this kind of work. Those engaged in examining white linen cloths suffer more than when dark colours are the subject of investigation; and among the coloured cloths the scarlet, with which our army is clothed, produces the worst effects. The reader is probably aware that white cloth reflects most light; and that of all the colours of the spectrum red is the least refrangible; and although yellow and orange colours afford most light, yet red affords most heat, and is, from causes not well understood, productive of irritability to the eyes of most animals. Scarlet is a compound colour, containing a large proportion of red, combined with yellow*. Manufacturers of bright colours also suffer injury to the eyes.

It is said also that at the Bank of England a new issue of bank-notes is productive of ocular disease among the clerks, whose employment it is to examine, sign, and counter-sign an immense number of these documents per day. The money counters also, in the same establishment, are said to be peculiarly liable to amaurotic affections, especially at every new issue of coinage, when the pieces are highly polished, and consequently reflect much light.

Burnishers form another class of persons peculiarly liable to this disease, particularly such as are engaged in producing upon metallic surfaces a high degree of polish. One of the results of the simple, and otherwise admirable, principle of the division of labour, is certainly attended in some cases with its evils, by splitting up one branch of business into a large number of collateral shoots, it reduces man to a machine, and often deprives him of the power of exercising his invention; and, as in this case, proves positively hurtful. Hence we have an additional proof of the value of automatic machinery in effecting those processes by which man is injured, and his powers impaired.

In the instances we have given, the hand and the eye are chiefly employed, while the mind rests; but Nature is not partial in her rewards or her punishments. A high degree of mental cultivation does not exempt a man from the *penalties* due to transgression: the disciple of Claude, or of Galileo—of Hunter, or of Watt,—is exposed (as we shall see) in the exercise of his high calling to the inconveniences of the humblest artisan. Nothing, in fact, proves so well to us the dependent and even coequal condition of man in the scheme of creation as the universality and individuality of the application of the natural laws to which we are all alike subject. We have heard the case of an eminent landscape-painter, who in the ardent pursuit of his profession became troubled with confusion and dimness of vision. He abandoned his practice for a time, and gave rest to his eyes, the inflammation of which yielded to proper medical treatment. Upon attempting to resume his occupations he was much alarmed to find that he no longer possessed the power of discriminating shades of colour from each other: he had, in fact, apparently lost the faculty necessary to his profession. He had again recourse to medical treatment, and after a time was restored to perfect sight.

The above instances occur, as it will be seen, in employments where too much light is admitted to the eye, whereby it becomes irritated and fatigued. On the other hand its occupation in a dim uncertain light is productive of results equally disastrous. In this case it is strained as it were beyond its powers, in endeavouring to exercise its function in the absence of the only necessary means, namely, a moderate and steady supply of light. Such persons are the numerous class of miners and colliers, whose employment is underground, amid the fitful gleams of a few lamps or candles, which the very position of the workmen prevent from being other than weak and almost inadequate sources of illumination; while in the collieries the lamps are necessarily surrounded with wire-gauze to prevent the firing of the gas which often issues from the apertures (blowers) laid open by the workman's pick, and thus the already feeble illumination is enfeebled. The exposure then of the eye to this bad light for several hours, and the transition into the light of day above when the miners' daily toil is done, is in many cases productive of the disease we have described. In the stupendous mines of Southern America immense numbers of the natives were, while under Spanish dominion, kept entirely in the mines, together with their wives and children; and thus, as an ingenious Frenchman observes, those very persons whose ancestors worshipped the sun are born, live, and die, without ever having been blessed with a sight of his rays.

> Ah! what avail their fatal treasures, hid
> Deep in the bowels of the pitying earth,
> Golconda's gems, and sad Potosi's mines;
> Where dwelt the gentlest Children of the Sun?
>
> THOMSON.

The united effect of the dim light in which colliers are constrained to perform their daily labour, and of the contaminated atmosphere which they breathe, is thus alluded to by Mr. Thackrah, in his work on the *Effects of Trades, Professions, &c. on the Health.*

The eyes of colliers are small, affected with chronic inflammation, and intolerant of full light. Boys enter the pit at the age of six or seven, and are employed in opening the trap-doors, driving the horses, propelling the trucks, &c.; and finally, when of sufficient age, they become colliers. Sickness and vomiting sometimes affect persons at their commencing the employ, and many after a few years' trial are obliged, by the injury which their health has sustained, and especially by the weakness of the eyes, to leave the mine.

(3.) As the exposure of the eye to too much light is injurious, it almost follows that too much heat is equally so. It is painful to reflect that many of our

* The bull, the turkey, and other animals, manifest great impatience and anger at the sight of a red colour. This is probably due to an irritation of the optic nerve, induced by this particular colour: this is, however, only a surmise of the writer. A young man was recently killed by holding out his tongue to an adder which he had caught, and doubting whether it was a snake or an adder, put out his tongue to test the fact. The animal, irritated by the red appearance of the tongue, bit it; and the bite was fatal, for the young man died some hours afterwards.

luxuries are purchased at the expense of much human suffering. True it is that by habit men may become inured to extraordinary and unnatural circumstances, which do not indeed exert their fatal influence at once upon them, but which would sink an unaccustomed hand. Undoubtedly, by early use and training, the body may successfully withstand high degrees of heat, as the experiments of Sir C. Blagden, Chantrey, and others, and the every-day experience of our gas-factories, glass-houses, &c., prove; and it is possible that in all the successful cases the individuals are fitted peculiarly by nature, or the habit of early training, for the exercise of these pursuits; still, however, it is to be lamented that there are many cases of workmen whose powers fail them for their own peculiar callings. How far habits of intemperance influence their fate, it is not within our province to discuss, although we fear that much is to be attributed to this energetic and too common cause.

On a visit a few years ago to an immense foundry, about noon on a hot summer's day, we were much struck by the situation chosen by several of the men for the consumption of their dinner. They were seated on the copings of several enormous forge-fires, the heat of which was so great as to prevent our approach within several yards, and yet these men appeared to suffer no inconvenience whatever, for as it would seem they were in a temperature natural to them, which, however, was so great that the broad sunshine, into which we soon went, appeared cool in comparison.

But the above instance of the power of the human frame to bear intense degrees of heat, sinks into insignificance when compared with many cases of constant occurrence in the arts and manufactures. We must be content at present with the selection of one only. The reader may be aware that steel is fusible, or capable of being melted, and when in the fluid state of being cast in moulds, by which process the natural qualities of the metal, its hardness and elasticity, and the permanence of the edge in cutting-tools, are very much improved. The steel which is to be cast is previously broken into small pieces, put into a clay crucible capable of holding between thirty and forty pounds of the metal, and so placed in a wind-furnace, where it is brought to a white heat, which is sustained for about four hours, in which time the liquefaction of the mass is complete: the furnace-cover is then removed, and other preparations are made for pouring the metal into cast-iron moulds. "This is a process which places the melter in a situation little, if at all, enviable, as compared with the inside of M. Chabert's celebrated oven: indeed the eyes and the hands that are daily conversant with molten steel would hardly shrink at the mention of a temperature sufficient to broil a beef-steak! Previously to drawing the crucible, the artist, whose body, arms, and legs, are defended by sacking-wrappers, goes to a water-trough, and with a besom thoroughly moistens his outer covering, that his clothes may not get a-flame, while he is bending over the mouth of the 'burning fiery furnace.' Thus prepared, with a pair of strong tongs he withdraws the pot from the fire, takes the lid off, and pours the metal into the mould. The ingot thus formed is either a bar about two inches square for tilting, or a plate six inches broad, twelve to eighteen inches long, and an inch thick, for rolling, as the same may be wanted to be wrought into its ultimate form by the hammer or the shears. It may perhaps be thought that this fluxing and pouring of the metal requires no very great skill in the management. It is, however, a fact, that so much depends upon the most exact attention to a number of minute particulars, only to be attained by a rare union of judgment and experience, that a person who thoroughly understands the business is invaluable as a workman, and his earnings are accordingly great. Honourable instances are not wanting of these melters having become persons of property, not to say that they have set up their carriages! The importance of their avocation is indeed much greater than may generally be imagined, even when the best irons are used. Not only does the perfection of innumerable exquisite cutting instruments depend almost entirely upon the quality of the metal, but much of the glory of the fine arts. The steel plates, which by a wonderful triumph of skill the engraver has appropriated, the burine of Heath and the chisel of Chantrey, respectively owe their excellence to a judicious management of the crucible by the Sheffield cast-steel melter."—*Manufactures in Metal.*

A melancholy case has occured recently to a friend of the writer, an ingenious painter on glass and glass-stainer. The stained glass which enters into the composition of church and cathedral windows, often containing pictures and figures of high excellence, is produced in the first instance, by applying a coloured composition to white glass, or painting on glass, as on canvass, with a coloured compost which will resist heat: the glass being thus prepared by the artist, its durability through long ages is ensured by a process termed *firing*, which consists in placing the glass in a close iron box or oven, called a *muffle*, and which is provided with horizontal iron shelves, placed at regular distances, and covered with well-burnt powdered lime, to prevent the contact of the glass and the hot metal. On these shelves the glass plates are deposited, the coloured surfaces of course upwards. The muffles are placed in a furnace, and each muffle is furnished with a tube, which passes out through the furnace-wall, the use of which tube is to enable the operator to examine the state of the glass during the process of firing. A fire is now kindled and heat continued until, on inspection, the glass contained in the muffle is found to have acquired a heat just sufficient to fuse it: by this means the colours are absorbed into and become part of the glass. The watchful eye of experience alone detects the exact moment when the white heat, to which the furnace has been brought, must be reduced: the whole contents of the furnace are left to cool gradually for about twelve hours, at the end of which time the glass is said to be annealed, or to have lost that brittleness which it would have had if it had been removed from the furnace immediately.

The gentleman referred to had been engaged for several years in managing the above process, when a few months back, after looking for a longer time than usual through one of the tubes into the furnace, while the contents of the latter were at a white heat, he entirely, and as it appeared to him suddenly, lost the sight of the eye he was employing. The retina was in fact struck with palsy, from which we regret to add he has not since recovered. And yet how wonderful is the fact, that although the eye in this case is totally insensible to luminous impressions, and at present is of no assistance to its owner, yet the pupil still retains to a certain extent its contractile and expansive power when light is more or less admitted to the visionless orb. This fact tends to show how independent the function of the iris is of the will.

In this class are included stokers in iron-furnaces and glass-houses, and the denizens of the smithy generally, together with tavern cooks, &c.

THE OVAL, THE ELEMENTARY FORM OF BEAUTY.

THE indescribable beauty of outline which pervades many of the works of antiquity, has been the cause of many attempts to discover if there was any fundamental principle to which this peculiar beauty was to be ascribed. All parties seem to have agreed that it depends on various modifications of a curved line. Mr. Reinagle, the Royal Academician, endeavoured to show, in a lecture delivered at the Royal Institution in 1827, that ovals of various sizes would mechanically produce various elegant and symmetrical outlines. His endeavour was to prove, "that a line formed by an elliptic curve was beautiful even in an abstract point of view, free from all association." To illustrate his views he employed various diagrams, such as are seen in the following figures.

1 2 3 4 5 6 7 8 9

No. 1 and 2 are a series of straight parallel lines, arranged horizontally and vertically; these were shown to produce no principle of beauty. In No. 3, a series of straight lines are drawn so as to radiate from a centre producing the simplest beautiful arrangement of lines. In Nos. 4 and 5, he endeavoured to prove that a series of straight lines, radiating from centres, as fig. 4, were improved in beauty by the addition of curves, as in No. 5. Nos. 6 and 7 illustrate the improvement produced by substituting curves in the rays, as in No. 6, and a still further improvement by additional curves, as in No. 7. Pursuing the same idea, it was shown that if the rays proceeded from a curved instead of a straight line, as in Nos. 8, 9, the beauty of the arrangement was increased, No. 9 being the most elegant.

If an oval disk, fig. 2, is prepared, the beauty of the

Fig. 2.

Fig. 3.

combination of elliptic curves may be illustrated in various ways, as in fig. 3, where the curves are placed at random; fig. 4, in which they radiate from a centre, forming a most beautiful figure, capable of becoming the ground-work of an elegant design in foliage or ornament. If the oval disk is applied, as in fig. 5, and the whole of its outline repeatedly drawn, a

Fig. 4.

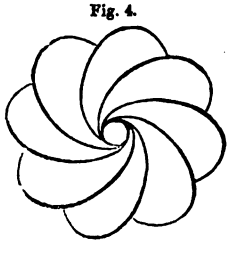
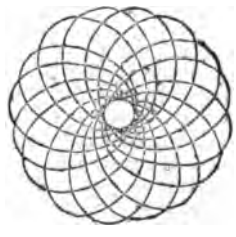


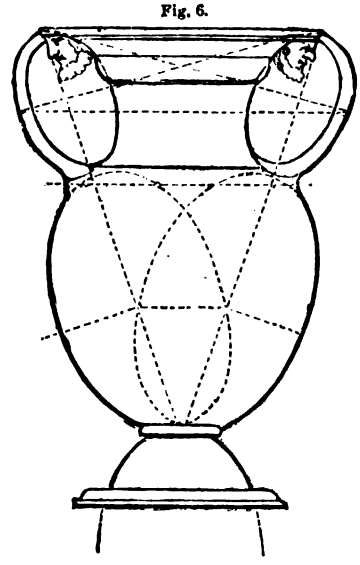
Fig. 5.



much more elegant and complicated figure is produced, something like what school boys draw with a pair of compasses, and known by the name of a Turk's cap.

The following method of further elucidating the properties of the oval, will form an amusing problem for the young draughtsman. To make these drawings, two ovals of different sizes, cut in card-board, are necessary. Fig. 6 is a Greek vase, with handles,

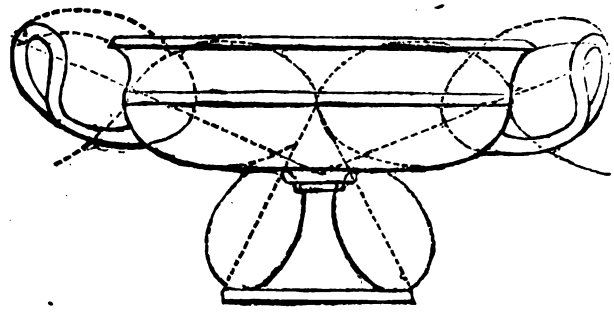
Fig. 6.



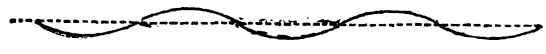
formed in the following proportions of seven parts; the body has four parts, the foot one, and the neck two. The greatest width of the body is equal to the longest diameter of the larger oval.

Fig. 7 is another illustration of the use of the oval in forming a flattened vessel called a *patera*.

Fig. 7.



We have thus seen in what manner many elegant figures can be produced by the symmetrical arrangement of elliptic curves; some, however, contend that the line of beauty is formed of what is called an hexagonal curve, that is, an arc of a circle equal in length to one-sixth part of its diameter. In this manner the following elegant serpentine lines are produced. The outline of the human face is said to be formed of hexagonal curves.



NATURE has perfections in order to show that she is the image of God, and defects in order to show that she is only his image.—PASCAL.

ABSTRUSE speculations, whatever they may have at the bottom of solidity and truth, suit not the capacities of the many, and influence the hearts of none.—BISHOP HORSLEY.

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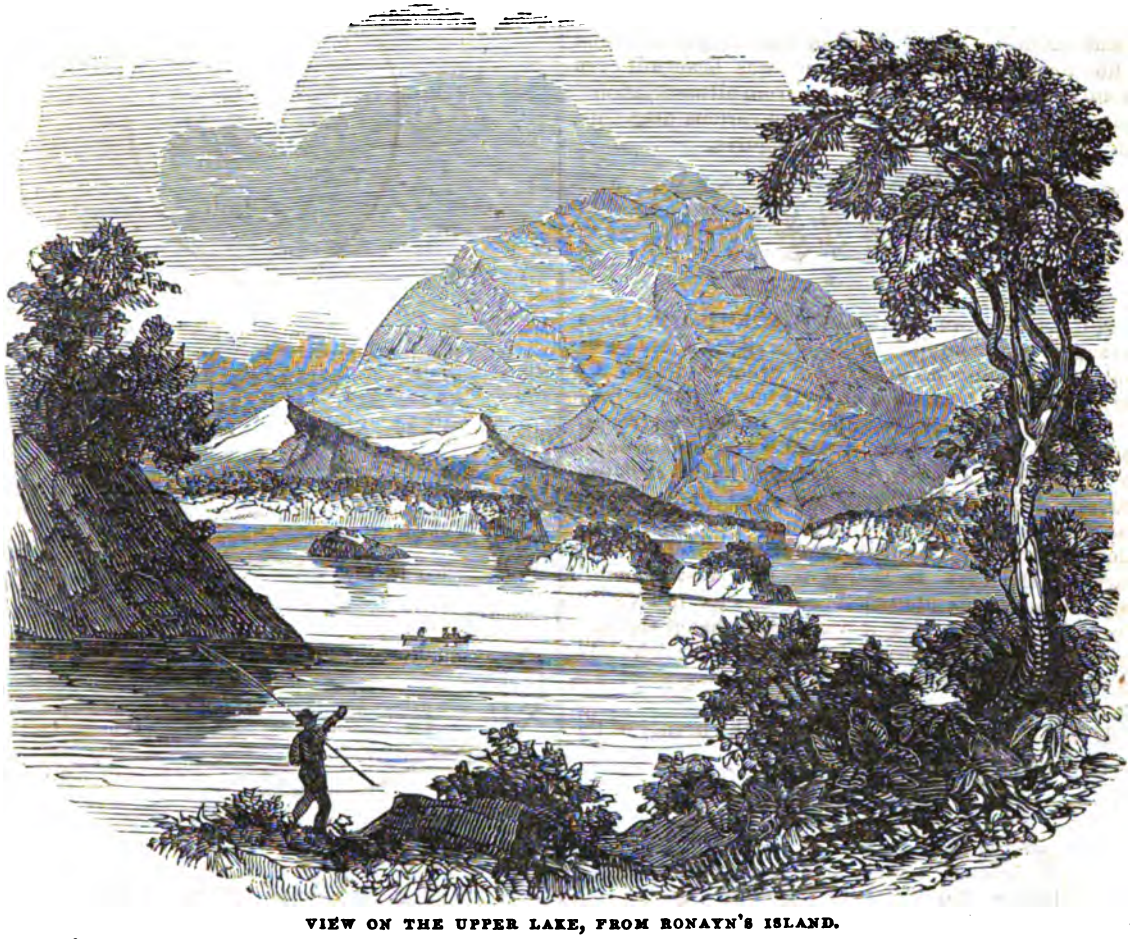
KILLARNEY. No. VIII.



VIEW ON THE UPPER LAKE, FROM RONAYN'S ISLAND.

THE Upper Lake at Killarney, lying to the westward of the Lower Lakes, is embosomed above them in the mass of mountains which, for some distance, covers the country beyond them in that direction. The lofty wall thus separating it from them, is perforated only at one point, where a deep defile affords a narrow channel for the waters descending from the Upper Lake to the Lower Lakes. For a long time the only convenient mode of passing from the Lower Lakes to the Upper Lake was by ascending this connecting stream in a boat; but within the last few years a new road has been constructed, running up along the margin of the channel. This road does not end at the top of the channel; it passes by the Upper Lake, (at one part through a tunnel,) and continuing its course to the westward between the mountains, at length reaches the town of Kenmare, upon that inlet of the Atlantic which is called Kenmare River.

The channel of communication itself is about three miles in length; it winds considerably, and varies very much in its breadth. The narrowest part is at the very top, where it is contracted into a little passage, scarcely more than thirty feet broad. This pass bears the appellation of Coleman's Leap; and it is said to be so called after a legendary hero of that name, who, in the eagerness of the chase, or in the pursuit of an enemy, leaped across the chasm here, and left the impression of his foot or feet (for the accounts differ,) in the solid rock. There is a mark still shown as his veritable foot-print, and the wonderful phenomenon is "minutely described, and studiously exaggerated, by the credulous guides."

To a traveller ascending this connecting river in his passage from the Lower Lakes to the Upper Lake, this extraordinary contraction of the channel at Coleman's Leap has a very remarkable appearance.

The devious course of the river above the Eagles' Nest*, and the numerous impediments which commonly arise from rocks, shoals, and the rapidity of the current, are productive of repeated disappointment, and excite no small degree of impatience in those who anticipate the view of the romantic confines of the Upper Lake. The long-wished for scene is expected to open at every turn; but one short reach of the river succeeds to another, terminated by huge rocks, beyond which nothing is visible but distant mountains. At length the boat arrives in a little basin, bounded for the most part by steep rocks, to which several different outlets appear. The stranger naturally concludes that one to be the proper channel which is the widest, and whose direction accords best with the course of the river; it is not without

* Of this remarkable rock we have already given a description. See Killarney, No. I., Vol. XI., p. 57.

surprise therefore that he beholds the oars, after a few strong and rapid stokes, drawn in, and the boat suddenly put about and directed through a narrow pass between the rocks, barely sufficient for its admission. This is the entrance to the Upper Lake, and soon after passing it, the most distant shores are revealed to view, with the immense mountains which rise beyond them.

On passing Coleman's Leap the traveller enters at once upon the Upper Lake. He finds it to be entirely encompassed by mountains; and if, after proceeding a short distance, he cast his eyes back, he is unable to distinguish the narrow opening by which he entered, so completely is it lost in the confusion of hill, bay, and promontory. "In this retreat from the busy scenes of life, the beautiful and the sublime are exquisitely united."

On the south of the lake stands Cromiglaun or the Drooping Mountain, which rises from the very water. Adjoining this, on the west, is Derricunnihy, after which comes Derry-Dinna, separated from it by the little river Kavoge. The Coombui Mountains are seen in the distance towards the south-west; and further to the west is Barnasna. In the west are also seen Baum, with its conical summit, and the Macgillicuddy's Reeks, with their lofty, shattered, and shelving tops. The nearest of the Reeks to the lake is that called Ghirmeen, at the foot of which is the entrance to the sequestered defile of Comme Duff, or the Black Valley. On the north and east are Ghirmeen and the Purple Mountain at a distance, and the Long Range (as the mountains on the north of the channel between the Upper and Lower Lakes are called,) backed by Tomies and Glena.

From its situation in the midst of a stupendous amphitheatre of mountains, the Upper Lake displays the most wild and romantic scenery. Its length is nearly the same as that of Turk, its breadth somewhat inferior. The mountains which bound it on every side, are a continuation of those forming the defile through which it is approached, and their characteristic features are similar, but they are loftier, and all their parts are on a grander scale; the glens are deeper, the woods more extensive and of older growth, the rivers larger, and the falls more lofty and precipitous. The highest mountains are those at the upper end of the lake, which are likewise the most varied in their outline; among them rise Macgillicuddy's Reeks, "pre-eminent in grandeur." Of these Reeks, which are the highest mountains in Ireland, we have already given an account*. They are visible from the Lower Lake, but their appearance, from the Upper Lake, is so different, that they would scarcely be recognised for the same.

On entering the Upper Lake (says Mr. Weld,) the attention is at first wholly engaged by the vastness of the mountains, and next by the extreme wildness and ruggedness of the scene. The numerous islands, as well as the shores, present on every side immense rocks; some bleak and terrific, others of a less savage aspect, teeming with vegetable life.

The islands in the Upper Lake are very numerous; the rocks along their shores generally consist of a green stone, which, close to the edge, assumes a dark hue, agreeing so nearly with the reflections of overshadowing trees in calm weather, that the line of separation cannot be traced without difficulty.

And here (says Mr. Wright), as in all her works, Nature has proved herself the most accomplished artist, in adapting the light and airy tints of the limestone-rock to the gay and luxuriant shores of Glena and Mucruss, and the more dingy shadows to the bold, terrific, and savage features of the Upper Lake. This exposure of the rocky bases of the islands and stony strands, which occur in the lakes of Kerry, forms a distinguishing character between them and the English lakes, where the green sod always confines the apparently overflowing waters, producing the idea of eternal plenitude.

The most striking of the islands upon entering the lake is, Oak Isle, or Rossburkree, which in the Winter season, is separated into several parts, so as to form a cluster of islets. It rises from a rocky base, and is crowned with wood; from its shores is obtained a splendid and majestic view of the lofty mountains, which form so characteristic a feature of Killarney, grouped in the most varied manner.

The shores of the Upper Lake are extremely intricate, being indented by numerous wooded and rocky promontories, by bays, inlets, and long creeks, which wind towards the base of the mountains, as if purposely to receive the streams which rush through the glens, and conduct their waters in silence and tranquillity to the lake. The largest of these inlets is that bearing the name of Newfoundland, which lies at the eastern extremity of the lake, and is nearly three quarters of a mile long. The entrance into this inlet lies through a narrow pass, defended by two vast perpendicular rocks, in passing which an extensive basin suddenly opens to view, bearing the appearance of a fourth lake. On the right of this inlet rises a steep overshadowing cliff, clothed with straggling trees: on the opposite side it is bounded by masses of bleak rocks, while the distant view in the middle of the picture is occupied by a wood of oaks, from out of which issues the river Esknamucky, which may be ascended for some way in a boat. Mr. Wright says that a walk along the banks of this stream will surprise and delight the tourist. An irregular path winds along the banks between trees whose thick foliage confines the view until at the end of about half a mile, a space suddenly opens, discovering some cottages, surrounded by a few small enclosures. The sound of falling water here strikes the ear; and on turning the eye towards the Turk mountain, which the visiter has thus insensibly approached, a beautiful cascade is seen over the trees at the head of a deep glen.

It is scarcely in the power of imagination to conceive a more romantic retreat. No vestige of human industry appears beyond the precincts of this little hamlet: woods and mountains surround it, and the inhabitants seem totally cut off from the society of their fellow creatures. Nor is the retreat less remote in reality from the busy scenes of life than it appears to be: the plough has never left the traces of its furrows on the vale; the soil is turned with the spade; and the produce, if more than sufficient for the maintenance of the humble cultivators, is conveyed away on horses, by a craggy path which winds along the borders of the stream.

Advancing up the lake towards its western end the visiter passes Arbutus Island, which lies on the northern shore, about half a mile to the west of the entrance into the lake at Coleman's Eye. It is so called on account of the profusion of the arbutus plant which it displays, and which indeed covers the rocky sides of its pyramidal form. Of these strawberry trees, which are to be found in abundance on every part of the shores of Killarney, but in especial luxuriance in the islands of the Upper Lake, which are celebrated for possessing the finest specimens of the plant in the British Islands,—an anonymous writer thus speaks:—

In the latter end of October, when I first visited Killarney, they were in high beauty, many of their bells and blossoms still remaining, the fruit on some just forming, and on others nearly ripe. The same bough often exhibited all these varieties. The ordinary height of the tree is ten or twelve feet; but I have seen some, of a happier growth, which rose to eighteen or twenty. The blossom is shaped like a goblet, and the fruit nearly spherical; it is at first

* See *Saturday Magazine*, Vol. XII., p. 137.

of a pale yellow, which deepens as it advances to ripeness, and gradually gives place to a rich scarlet. It equals the largest garden strawberry in size, but must be eaten with more caution, for those who are unaccustomed to it, and indulge too freely, are seized with an oppression little less than lethargic. This I take upon the credit of the country-people, who use it themselves without reserve, generally accompanying it with a hearty draught of water, to qualify its juices. The elder Pliny calls this fruit *unido*, because no more than one berry can be eaten at a time with safety; but Virgil makes it the common food of the first inhabitants of the earth; following Lucretius, who ranks it with the acorn itself, and tells us that in the earlier ages it grew to an extraordinary size, and was found in great abundance. The arbutus was no less esteemed among the ancients for its pleasant shade than for its fruit, as may be discovered from the poets, and particularly from Horace, the admirer and best judge of whatever is elegant in retirement.

Thy isle, gay green, of never-fading dye,
Spreads Nature's comeliest wardrobe to the eye
And when the honours of the groves are shed,
Midst the pale ruin lifts its blooming head:
Now o'er the glassy and pellucid stream,
Throws the mild lustre of the emerald beam;
One everlasting smile of joy it wears,
And winter's sickly, drear dominion, cheers.

A little beyond Arbutus Island, on the opposite side of the lake, the visiter reaches Coffin Point; and as soon as he has doubled it, he discovers that it is the end of a very long narrow promontory, and stands at the mouth of a large bay or inlet, which runs inland for a considerable distance, and receives at its termination or head, the little river of Derricunnihy Mountain, or the river Kavoge as it is called. The cascades on this river far surpass, both in beauty and volume, all others at Killarney, being, in general, the best supplied with water. They lie concealed from the lake, being situated in the depths of a thick wood; and the numerous rocks and thick tangled underwood which intervene, render the approach to them a task of some difficulty.

At the western end of the lake lies the little cluster or archipelago of the Seven Islands, which are beautiful in themselves, and so grouped as to form a delightful assemblage. They are all lofty and rise very boldly from the water upon rocky bases, whose bold broken crags in many places overhang the lake, which "seem to forbid the approach of human footsteps, and consecrate them to their native ospreys and eagles."

The largest of these islands is called Ronan's or Ronayn's Island; and a visit to it forms an essential part of the regular tour of the lakes. It is richly wooded with oak, arbutus, and other trees, and is accessible at only one spot, namely, close to the cottage. Hence a path winding round the rocks leads to an eminence or sort of natural terrace on the summit of an island, about thirty feet above the surface of the water.

No power of language, (says Mr. Weld,) is adequate to convey an idea of the wildness and variety of the view which opens from this spot. The lake is seen in all its intricate windings studded with islands, and bounded by immense mountains—

With woods o'erhung and shagg'd with mossy rock,
Whence on each hand the gushing waters play,
And down the rough cascades white dashing fall,
Or gleam in lengthened vistas through the trees.

Not a single habitation, not a trace of man's labour can be discovered in any part of this vast amphitheatre. . . . . It is scarcely possible to enter the confines of this sequestered and enchanting region, without feeling the influence of a spell which abstracts the mind from the noise and folly of the world, and banishes for the moment the desire of returning to the gay and busy scenes of human life.

It is from Ronayn's Island that the view represented in our engraving is taken: the large mountain in the background is that which bears the name of Derricunnihy. The surface of the island is covered with successive layers of the decayed vegetable matter, which is furnished by the trees, and the appearance of which is deserving of notice.

In traversing this island, (says an anonymous writer,) I observed it was carpeted over with a thick covering of decayed leaves and boughs. I could easily discover the strata of the several past years by the different degrees of putrefaction; till near the bottom, where the dissolution was more complete, they were cemented into one uniform mass condensed by the pressure above, and so swoln by the rains and moisture as not to be at all distinguishable. As the decay was more perfect, the colours declined more perceptibly from the original lighter tints, ending in the bottom in as perfect a black as I ever saw in any of our bogs. The similitude of the contexture as well as the colour, convinced me that the black bogs with which Ireland abounds, have been formed by the same process: a process which is probably forwarded by the continual moisture and rains in a climate neither burnt up by scorching heats, nor congealed by the rigours of cold.

The similarity here spoken of between the mass of decayed vegetable upon this island and the peat of the bogs does exist. The average depth of the peat in the bogs being twenty-five feet, its surface is covered with moss of various species, and to the depth of ten feet it is composed of a mass of the fibres of similar vegetables in different stages of decomposition, proportioned to their depth from the surface; below this to the depth perhaps of ten feet more, generally lies a light blackish-brown turf, in which the fibres of moss are still visible though not perfect. At a greater depth the fibres of vegetable matter cease to be visible, the colour of the turf becoming blacker, and the substance much more compact in proportion as the depth increases; near the bottom it forms a black, which, when dry, has a strong resemblance to pitch or bituminous coal. The old opinion, however, at one time very generally adopted, that the bogs have originated from the decay of large forests is not tenable at the present day; more recent investigations having led to the discovery of facts incompatible with that theory of their formation. The trees which are found in the bogs, standing as they grew, have generally six or seven feet of compact peat under their roots, clearly proving the formation of the peat to have been previous to the growth of the trees.

To enter at any length into a description of the various bays and inlets, glens and cascades on this romantic lake, would be useless and fatiguing to the reader. The visiter who has sufficient time at his disposal will do well to explore it at his ease; he will find an ample reward for his trouble in the extraordinary variety of scenes which its irregular and almost fantastic arrangement enables it to display.

The new road running along the margin of the channel between the Upper Lake and the Lower Lakes, should not pass unvisited; to those who have but a little time at their disposal, it affords a good survey of this remarkable passage which is spoken of as being "quite unique in mountain scenery." The rocks which enclose the channel have a very romantic appearance, every cleft being choked with arbutus, holly, and other evergreens; and "the scenery along the whole of this beautiful piece of road," to use the words of Mr. Barrow, "is quite enchanting."

The new road to Kenmare, (says another recent writer,) has converted the aquatic system of viewing the lakes into a more secure, and for that reason, perhaps, a more agreeable mode, and has at the same time unfolded a new series of landscapes into which the lakes themselves enter as minor component parts, an advantage but partially enjoyed in sketching either from the water or its banks. From the curious tunnel through which Mr. Griffiths' romantic road is conveyed, the Upper Lake is seen expanding and spreading away amidst little bays and indentations, until it appears to lave the foot of the majestic Carran Tual.

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY.

No. XIII.

THE OVERTHROW OF PHARAOH'S HOST IN THE RED SEA.

PHARAOH had no sooner given the children of Israel liberty to depart than he became sorry for his concessions, and resolved to pursue them. From what we have said before, it is evident that the Hebrews were valuable subjects; they occupied rich pastures which the native Egyptians would have neglected, partly from their dislike of a pastoral life, and partly from dread of the Arab tribes; they had been profitable slaves in executing the public works, which the usurping invaders had deemed necessary for their security; and, finally, their example was likely to influence other races in Upper and Middle Egypt, to withdraw themselves from their allegiance to the foreign intruders. The Scripture narrative very clearly intimates the motives which actuated the wicked king.

And it was told the king of Egypt that the people fled: and the heart of Pharaoh and of his servants was turned against the people, and they said, Why have we done this, that we have let Israel go from serving us? (Exod. xiv. 5.)

It was no point of duty, no feeling of pride, and still less was it any sense of wrong, which induced the monarch to violate the compact he had so recently made with Moses. Avarice, not ambition, hurried him forward; he was enraged at the thought of losing such profitable slaves. His preparations for the pursuit must next engage our attention.

CHARIOT, CHARIOTEER, AND WARRIOR.

And he made ready his chariot, and took his people with him: And he took six hundred chosen chariots, and all the chariots of Egypt, and captains over every one of them. And the Lord hardened the heart of Pharaoh king of Egypt, and he pursued after the children of Israel: and the children of Israel went out with an high hand. But the Egyptians pursued after them, all the horses and chariots of Pharaoh, and his horsemen, and his army, and overtook them encamping by the sea, beside Pi-hahiroth, before Baal-zephon. (Exod. xiv. 6—9.)

It is first mentioned, that "he made ready his chariot;" on the monuments kings and noble warriors appear always mounted in chariots, when they are going out to war or to a distant chase. The chariot appears generally to have been framed of wood, but in one or two instances it would seem as if at least part of the frame was made of brass. It was mounted on two wheels, which were sometimes of wood and sometimes of metal. In the age of Solomon cast wheels appear to have been principally used, for in the description of the great brazen laver, we read,

Under the borders were four wheels; and the axletrees of the wheels were joined to the base: and the height of a wheel was a cubit and half a cubit. And the work of the wheels was like the work of a chariot-wheel: their axletrees, and their naves, and their felloes and their spokes, were all molten. (I. Kings, vii. 32, 33.)

The engraving which we have copied, represents a Jewish, not an Egyptian chariot, but the description of one is, in a great degree, applicable to the other; and we shall, as we proceed, point out the most remarkable points in which they differed. The chariots were intended to carry two warriors, one of whom principally attended to the management of the horses, while the other wielded the weapons of war. But in the Egyptian representations, we frequently find the king or warrior alone in the chariot, and in one example we see the charioteer with the reins fastened round his body, while his hands are engaged in wielding his bow and arrows. No mention is made of any similar practice in Holy Writ; whenever there is mention made of a royal chariot, the driver or charioteer is particularly noticed. Thus, in the account of Ahab's death at the battle of Ramoth Gilead:

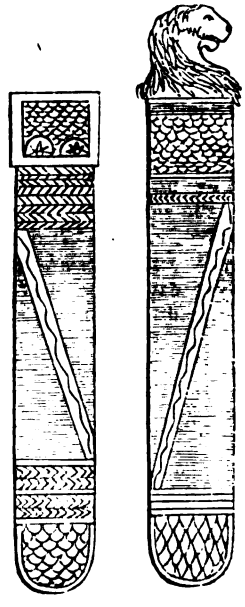
And a certain man drew a bow at a venture, and smote the king of Israel between the joints of the harness: wherefore he said unto the driver of his chariot, Turn thine hand, and carry me out of the host; for I am wounded. And the battle increased that day: and the king was stayed up in his chariot against the Syrians, and died at even: and the blood ran out of the wound into the midst of the chariot. (I. Kings, xxii. 34, 35.)

The second verse which we have quoted, leads us to remark a peculiarity of the ancient chariots, which we shall again have occasion to notice; they were open at the back, and unprovided with a seat; hence when Ahab was mortally wounded, his servants were obliged "to stay him up" in his chariot, otherwise he must have fallen out in the hurry of the retreat. This circumstance also enables us to appreciate the fulfilment of Elijah's remarkable denunciation against Ahab:

Thus saith the Lord, Hast thou killed, and also taken possession? And thou shalt speak unto him, saying, Thus saith the Lord, In the place where dogs licked the blood of Naboth shall dogs lick thy blood, even thine. (I. Kings, xxi. 19.)

The blood welling from the wound coagulated on the floor of the chariot, and when the servants washed it in the pool of Samaria, the dogs licked the drops as they trickled on the ground.

Every chariot was drawn by two horses, and great attention was bestowed on the breeding and training of the steeds. They were richly caparisoned, and their heads were frequently adorned with plumes of ostrich feathers. The Egyptian chariots had usually a quiver and bow-case fixed outside them, which were decorated with extraordinary taste and skill, so that they contributed very much to the picturesque effect of the chariot. The cover of the quiver was frequently fashioned into the head of some animal, and the sides of it were covered with embossed leather, or inlaid with variegated woods and ivory. The Hebrews did not make so much use of the bow as the Syrians and Egyptians. We find that one of the earliest improvements made by David after his accession, was the formation of a company of archers, which he levied from the tribe of Judah. In close combat the Egyptian cha-



QUIVERS.

rioteers used either the curved sword, commonly called the falchion, or a heavy and formidable weapon,

FALCHION.

similar to the pole-axe of the middle ages; and as the cars were hung low, the warrior in the chariot could easily cut down an enemy who opposed him on foot.

POLE-AXE.

Chariots were regarded as the most valuable part of an army's equipment in ancient times, and those of Egypt were particularly celebrated. The number with which Pharaoh pursued the Israelites is very remarkable, for six hundred are mentioned as "chosen chariots," that is, such as were used by kings, nobles, and eminent warriors, which must, of course, have been only a small proportion of "all the chariots of Egypt." The Scriptural expression, that there were "captains over every one of the chariots," seems to intimate that the use of these vehicles was restricted to warriors of high rank, and this is confirmed by the monuments, which do not exhibit soldiers of the lower castes mounted in chariots.

It is generally believed that the use of war-chariots was anterior to that of cavalry or mounted horsemen. Homer mentions chariots only in all his descriptions of the battles round the walls of Troy. It is indeed very probable, that the notion of employing cavalry arose from the custom of bringing spare horses, as relays for the steeds which were either wearied from drawing the chariots or wounded in battle. This opinion is greatly strengthened by the account given of the entrance of the Egyptians into the dry bed of the Red Sea.

And the Egyptians pursued, and went in after them to the midst of the sea, even all Pharaoh's horses, his chariots, and his horsemen. (Exod. xiv. 23.)

The word rendered "horsemen" may, with more propriety, be translated charioteers, and the horses, which are mentioned distinct from the chariots, were probably the relays. Even so late as the days of Ahab, we find that chariots were preferred to cavalry, for when Benhadad, king of Syria, was about to invade Israel, his servants advised him,—

Do this thing, Take the kings away, every man out of his place, and put captains in their rooms: And number thee an army, like the army that thou hast lost, horse for horse, and chariot for chariot: and we will fight against them in the plain, and surely we shall be stronger than they. And he hearkened unto their voice, and did so. (I. Kings xx. 24—28.)

The horses here mentioned are clearly designed for the service of the chariots, and not for mounted cavalry. From Isaiah indeed we learn, that the Medes and Persians were the first nation that employed cavalry in aid of the corps of chariots, for in the beautiful description of the destruction of Babylon, we find that the circumstance which proved that the Assyrians must have been overthrown, was that the watchman saw a couple of horsemen accompanying a chariot.

Thus hath the Lord said unto me, Go, set a watchman, let him declare what he seeth. And he saw a chariot with a couple of horsemen, a chariot of asses, and a chariot of camels; and he hearkened diligently with much heed: And he cried, A lion: My lord, I stand continually upon the watchtower in the daytime, and I am set in my ward whole nights: And, behold, here cometh a chariot of men, with a couple of horsemen. And he answered and said, Babylon is fallen, is fallen; and all the graven images of her gods he hath broken unto the ground. (Isai. xxi. 6—9.)

This very simple explanation removes many of the difficulties which commentators have noticed in this remarkable prophecy; it has been asked, "how could it be known, from the appearance of a chario and a couple of horsemen, that Babylon had fallen?" The answer is, that the Assyrians and Babylonians never employed horsemen in conjunction with chariots, and hence this circumstance showed that the approaching chariot belonged to a different nation. And this is further confirmed by the prophet's direct description of the Persian army; "Elam (Persia,) bare the quiver with chariots of men and horsemen," (Isaiah xx. 6); a description which is confirmed by Xenophon, who declares that the three great lessons taught to the Persian youth, were "to use the bow, to manage the horse, and to speak truth."

The catastrophe of the Egyptian army is told in a few words by the sacred historian.

And the Lord said unto Moses, Stretch out thine hand over the sea, that the waters may come again upon the Egyptians, upon their chariots, and upon their horsemen. And Moses stretched forth his hand over the sea, and the sea returned to his strength when the morning appeared; and the Egyptians fled against it; and the Lord overthrew the Egyptians in the midst of the sea. And the waters returned, and covered the chariots, and the horsemen, and all the host of Pharaoh that came into the sea after them; there remained not so much as one of them. But the children of Israel walked upon dry land in the midst of the sea; and the waters were a wall unto them on their right hand, and on their left. Thus the Lord saved Israel that day out of the hand of the Egyptians; and Israel saw the Egyptians dead upon the sea shore. (Exodus xiv. 26—30.)

It has been sneeringly asked by infidels, "how it happens that no direct evidence of this great event has been discovered on the monuments?" We have already anticipated a great part of a satisfactory reply. The Pharaoh by whom the Israelites were persecuted and pursued, was a foreign intruder and conqueror, with whose fate the native Egyptians had no sympathy; and it may be added, that the monuments of Lower Egypt, where the Israelites abode, have not yet been explored, all the antiquities yet developed by the researches of travellers having been found in Middle and Upper Egypt. But the monuments of Middle Egypt afford some indirect confirmation of the overthrow of the intrusive Pharaoh, for they show us that the Hyksos, who had long tyrannized over the land, were, by some sudden event, reduced to such a state of weakness, that they were expelled with very little difficulty. Now such an event was most probably the sudden destruction of their best warriors in the Red Sea, which rendered them unable any longer to maintain their supremacy over the native Egyptians. And this view of the subject is confirmed by a remarkable direction given by Moses, in his recapitulation of the law, a little before his death, which took place many years after the Hyksos had been expelled from Egypt. He said to the congregation, "Thou shalt not abhor an Egyptian, because thou wast a stranger in his land." (Deut. xxiii. 7.) A very remarkable expression, which seems to draw a clear distinction between the native Egyptians and the intrusive conquerors by whom the Israelites were oppressed. Indeed we shall see in many subsequent examples, that so far from there being anything like an hereditary hatred between the Israelites and the Egyptians, the two nations evinced the most friendly dispositions towards each other, while an inveterate animosity existed between the Israelites and the Amalekites, who certainly belonged to the same race as the Hyksos.

ON THE DISPERSION OF SEEDS.

THIS problem has been executed in six different ways at least, more or less simple. These are, the exaltation of the seeds of plants on elastic stems, so as to be exposed to the action of the winds; a power of floating through water till they meet a point of attachment; their transportation by animals to which their receptacles or investments have served as food; transportation by the coats of animals; a provision in the form of wings, through which the winds may act more effectually on them; and lastly, an elastic power in their receptacle, through which they are forcibly rejected by the parent plant.

The first contrivance is so general, and appears to be so necessary a portion of the structure of the plant, that its design for the end in question is seldom noticed. Yet he who examines the grasses will not doubt of the consequences produced by the exaltation and elasticity of the stem, though he should choose to doubt that the dispersion of seeds was at least one end in view. In the mosses this intention can scarcely be questioned, since no other purpose can be assigned to the delicate and elastic foot-stems by which the seed-vessels are elevated above the plant. In these the flower blows in the bosom of the leaves; and almost everywhere else, throughout the vegetable world, where the flower blows, there does the seed also ripen, and thence is it dispersed. Here it is not so: the seed-vessel becomes raised far beyond the place of the flower, through the subsequent growth of a singularly elastic stem, there to ripen its contents, and to be exposed to those forces which may disperse widely as the winds themselves, those seeds which, light as the breeze that bears them, are of such high importance in the great economy of vegetation.

If the floating of seeds through water is a contrivance which, like the action of the winds, appears too much akin to what we carelessly term accident, to deserve notice: yet thus chiefly are the naked coral rocks of the great Pacific Ocean clothed with vegetation, and rendered fit for the habitation of man. Are we entitled to give the name of accident to that cause, or combination of causes, by which so great an end is produced, even though metaphysics, and religion equally, did not show that there can be no accident to the Creator and Governor of all things? The buoyancy of a cocoa-nut, the resisting investments, and the vitality of seeds, were not necessities; but there can be no accident when the end in question is thus attained; and when, without it, all those previous and wonderful contrivances by which these islands are created in the ocean would have been useless, while we can even believe that the important cocoa-palm was created a maritime plant for this very purpose. As much is it accident, that the same fluid which produces fire and maintains the life of animals, is also the highway of a bird through the clouds, and the moving power of a ship across the ocean; but this question will be set at rest, by producing a distinct provision for securing the end proposed in the transportation of seeds through water.

And this is found in the seeds of the submarine plants. These might have been carried any whither: but how were the seeds of the *fuci* to root themselves amid the waves? The contrivance is equally simple and effectual. They are surrounded by a mucilage which water cannot dissolve, and which enables them to adhere to whatever solid body they touch.

Nor is this the only subsidiary contrivance to prove that the power of water is one of the agents which the Creator has intentionally adopted for the dispersion of seeds. The down of the willow-seed is both its ship and its balloon: the tree is the inhabitant of rivers; and thus it is contrived that both the winds and the water shall convey its posterity, even to distant regions.

There is a rudeness of expedient, it may be said, and equally an appearance of accident, in ordering that the seeds of plants shall be dispersed through the coats and wanderings of animals. But neither was this undesigned, when the provisions for that end in the structure of the seeds in question are so remarkable, and often so accurately mechanical. All know the hooks on the bur, and those on the seeds of the adhesive galium and the geum, as all can equally see or infer the consequences: while the carrot, and others of the umbelliferous plants, afford further examples of an expedient, to which neither intention nor mechanical contrivance can be denied.

If there is at first sight a similar appearance of accident in dispersing the seeds of plants through the digestive organs of animals, the intention is here also rendered evident, by a still more complicated system of contrivance.

The fruit is the food of the animal; but the seed is protected from the action of the digestive powers by its investments; as it is also empowered to defy the animal chemistry by its vitality, even appearing to be thus quickened for its peculiar destination. Nor let this mode of dispersing seeds be thought of small moment; since it is one of the roads through which the coral islands become clothed with that vegetation which has rendered them what they now are.

But the following contrivances are so obviously mechanical, that it is impossible to doubt the design, or to avoid admiring the beauty and ingenuity of the mechanisms. If, in the case of the winged seeds, aid is derived from the adventitious power of the winds, the variety of resource through which that is brought into action is well deserving of attention.

The lime and the ash offer instances of wings, of the simplest nature; and in the seeds of the fir tribe there is a similar contrivance, but of a more delicate structure. But the far greater number of these mechanisms are produced from down, various in disposition as in strength; and often presenting arrangements of singular beauty and delicacy. There is no one of those structures more beautiful than that which occurs in the dandelion. Let him who can doubt that the most exquisite art designed and executed this most common, but not less wonderful piece of mechanism, examine a single star with its attached seed, the lengths of the stems, the mode of their divergences from the receptacle, and that accuracy in those divergences, which causes the edge of each star so to unite, that a continuous surface is the consequence, and neither interval nor irregularity exists. But that surface also forms a globe: while this must result, not merely from the distribution of the seeds, but from a mode of expansion in the receptacle, on drying, which, if aught ever appears to be casual and uncertain, would seem to be under the guidance of chance alone. Nothing appears intended here, yet the end is ever gained: and far more remarkably still is it gained, when not one of these receptacles is globular, nor even of a spherical surface; and when, beyond all this, few are in any manner regular in their forms, while scarcely any two are rigidly alike. Yet the result is ever the same. Be the receptacle what it may, the downy surface is a globe: while we can at least see that this was necessary, since thus it is enabled to evade, till the seeds are ripe for dispersion, the winds which would otherwise have carried them prematurely off, and defeated the Creator's intention. He who can look even at

this common and despised object, and not see in it a power which baffles all calculation, added to the most consummate art, may cease to study the Creator's works, for creation can teach him nothing. Even he who rejects or disdains these higher thoughts, should cease to pride himself on his talents for observation and reflection, if he is not struck by the efficacy of this most artificial and beautiful structure, for the intended ends; seeing that the storm passes over it unfelt, till the hour of its ultimate destiny is arrived.

The last provision of contrivances for dispersing the seeds of plants is founded on that most inexplicable property of matter, elasticity, so largely used throughout all creation: and it is the most purely mechanical, since it depends upon no extraneous aid. Under this principle the seed-vessel, or some part connected with it, is provided with a latent spring, to be brought into action as soon as the seeds are fit for dispersion, and not before. It is either incomplete, or dormant, under a detent or check, like the spring of a gun-lock. This alone is an ample proof of design; because it is a train long laid, and implying foresight. And the action of the spring is prepared as gradually as the ripening of the seed, under an adaptation equally bespeaking the nicest care; while the detent, when present, is also formed in a special part of the seed-vessel, destined to give way when its services are no longer wanted, or would be prejudicial.

In the Cardamine impatiens, and hirsuta, the valves of the pod are detained at the point, and they discharge the seeds with great force, by curling back when disengaged. In the Geraniums, the long beak of the seed forms the spring, and the detent is at the seed-vessel, which is also contrived to be but half a capsule, that its contents may escape. In the Broom, the crackling of which in a hot day is familiar, each valve recoils in a spiral direction when the detent yields, as is the case with many of this tribe: and in some of the familiar ferns it is also the recoiling elasticity of a spring, under different modes, which produces the desired effect.

The peculiarity of circumstances under which a similar invention in the Mesembryanthemums acts, adds much to our impression of the wisdom and foresight that have been exerted on this subject. In all the preceding instances, it is through the drying of the parts that the springs are brought into action: but had this been the case with that plant of the desert, the seeds would have fallen on an arid sand, and have failed. It is therefore commanded that the springs which have been constructed in the calyx, should close in dry weather, and open on the occurrence of moisture. Thus also is it with the rose of Jericho (*Anastatica*), where the seed-vessel is rolled along the sands by the winds, until, meeting with a moist spot, it opens and parts with its seeds in that only place amid the parched plain where provision has been made for their vegetation. Can anything have been neglected, where calculations so minute as this exist? And can this be aught but the result of thought and design, as of universal knowledge and perfect foresight?

These are contrivances for a great and valuable end, which we can especially appreciate, because we can compare them with our own designs: and as well might the inventor of the catapult and the cross-bow doubt his own ingenuity and intentions as those of the Creator.

[Abridged from Macculloch's *Proofs and Illustrations of the Attributes of God.*]

INVENTION OF THE MICROSCOPE AND THE TELESCOPE.

It has been well observed that about the same time when the invention of the telescope showed us that there might be myriads of other worlds claiming the Creator's care, the invention of the microscope proved to us that there were in our own world myriads of creatures, before unknown, which this care was preserving. While one discovery seemed to remove the Divine Providence further from us, the other gave us most striking examples that it was far more active in our neighbourhood than we had supposed: while the first extended the boundaries of God's known kingdom, the second made its known administration more minute and careful.

It appeared that in the leaf and in the bud, in solids and in fluids, animals existed hitherto unsuspected: the apparently dead masses and blank spaces of the world were found to swarm with life. And yet, of the animals thus revealed, all, though unknown to us before, had never been forgotten by Providence. Their structure, their vessels and limbs, their adaptation to their situation, their food and habitations, were regulated in as beautiful and complete a manner as those of the largest and apparently most favoured animals. The smallest insects are as exactly finished, often as gaily ornamented, as the most graceful beasts, or the birds of brightest plumage. And when we seem to go out of the domain of the complex animal structure with which we are familiar, and come to animals of apparently more scanty faculties, and less developed powers of enjoyment and action, we still find that their faculties and their senses are in exact harmony with their situation and circumstances; that the wants which they have are provided for, and the powers which they possess called into action. So that Müller, the patient and accurate observer of the smallest and most obscure microscopical animalcula, declares that all classes alike, those which have manifest organs, and those which have not, offer a vast quantity of new and striking views of the animal economy, every step of our discoveries leading us to admire the design and care of the Creator. We find, therefore, that the Divine Providence is, in fact, capable of extending itself adequately to an immense succession of tribes of beings, surpassing what we can image or could previously have anticipated; and thus we may feel secure, so far as analogy can secure us, that the mere multitude of created objects cannot remove us from the government and superintendence of the Creator.—Whewell.

PHOSPHORIC LIGHT EMITTED BY FLOWERS.

In the garden of the Duke of Buckingham, at Stowe, on the evening of Friday, September 4th, 1835, during a storm of thunder and lightning, accompanied by heavy rain, the leaves of the flower called *Œnothera macrocarpa*, a bed of which is in the garden, immediately opposite the windows of the manuscript library at Stowe, were observed to be brilliantly illuminated by phosphoric light. During the intervals of the flashes of lightning, the night was exceedingly dark, and nothing else could be distinguished in the gloom except the bright light upon the leaves of these flowers. The luminous appearance continued uninterruptedly for a considerable length of time: it did not appear to resemble any electric effect; and the opinion which seemed most probable was, that the plant, like many known instances, has a power of absorbing light, and giving it out under peculiar circumstances.—*Magazine of Popular Science.*

How difficult a thing it is to persuade a man to reason against his own interest, though he is convinced that equity is against him.—Trusler.

NOTES ON FOREST TREES. No. XXIII.

LEAF AND FRUIT OF THE CAMPHOR TREE.

THE CAMPHOR TREE, (*Dryobalanops camphora.*)

THE celebrated Camphor Tree of Sumatra is one of the largest trees of the forests of that island; it is also found in Borneo, and several other eastern islands of the East Indian Archipelago. The greatest part of the Camphor, however, which is brought to Europe, is produced by a species of laurel (*Laurus camphora*). That which is afforded by the tree now under notice, seldom reaches our market, being carried chiefly to China, where it fetches a very high price. That which is received in England comes from Japan, in casks and chests.

The Camphor yielded by the *Dryobalanops camphora*, is found occupying portions of about a foot, or a foot and a half, in the heart of the tree. The natives, in searching for the camphor, make a deep incision in the trunk, about fourteen or eighteen feet from the ground, with a *billing*, or Malay axe, and when it is discovered, the tree is felled, and cut into junks a fathom long. The same tree yields a liquid or oily matter, which has nearly the same properties as the camphor, and is supposed to be the first stage of its formation. The precise age when this tree begins to yield camphor has not yet been satisfactorily ascertained, but the young trees are known to yield only oil, that is, camphor in a liquid state.

The method of extracting the oil, is by making a deep incision with a small aperture, into the body of the tree, and the oil, if any, immediately gushes out and is received in bamboos. The product of a middling-sized tree is about eight China *catties*, or about eleven pounds, and a large tree will yield nearly double that quantity. It is said that trees which have been cut for the purpose of obtaining the oil, and left standing in that state, will often produce camphor eight or ten years after, but it is of an inferior quality.

Camphor is also prepared, in China, from the leaves and branches of a tree, called by the Chinese *tchang*. They take some branches fresh from the tree, chop them very small, and lay them to steep in spring-water for three days and three nights. After they have been soaked in this manner, they are put into a kettle, where they are boiled for a certain time, during which they are kept constantly stirred with a stick made of willow. When they perceive that the sap of these small chips adheres sufficiently to the stick in the form of a white frost, they strain the whole, taking care to throw away the dregs and refuse. This juice is afterwards poured gently into an earthen basin, well varnished, in which it is suffered to remain one night. Next morning it is found coagulated and formed into a solid mass. To purify this first preparation, they procure some fine earth, which, when pounded and reduced to a very fine powder, they put into the bottom of a basin made of copper; over this layer of earth they spread a layer of camphor, and continue thus until they have laid four strata. The last, which is of very fine earth, they cover up with the leaves of the penny-royal plant; and over the whole they place another basin, joining it very closely to the former by means of a kind of red earth that cements their brims together. The basin, thus prepared, is put over a fire, which must be managed so as to keep up an equal heat: experience teaches them to observe the proper degree. But above all they must be very attentive lest the plaster of earth which keeps the basins together should crack or fall off, as in that case the spirit would evaporate, and the whole process be spoiled. When the basins have been exposed to the necessary heat, they are taken off, and left to cool; after which they are separated, and the sublimated camphor is found adhering to the cover. If this operation be repeated two or three times, the camphor is found purer, and in larger pieces. Whenever it is necessary to use any quantity of this substance, it is put between two earthen vessels, the edges of which are surrounded with several bands of wet paper. These vessels are kept for about an hour over an equal and moderate fire; and when they are cool, the camphor is found in its utmost perfection, and ready for use.

The Greeks and the Romans appear to have been unacquainted with this valuable drug, and we are indebted to the Arabians for a knowledge of it. The chemical properties of Camphor are thus described.—"Camphor is a vegetable substance, of an oily nature, combustible, odoriferous, volatile, concrete, and crystalline." Its smell is strong and penetrating; its inflammable nature is so great, that it will burn when floating on the surface of water. A curious rotatory movement takes place among small particles of Camphor when sprinkled on the surface of water; and if a cylindrical piece of Camphor is partly plunged in the liquid, it is dissolved, not equally over the whole immersed portion, but with great rapidity at that part which is on a level with the surface of the water. Camphor is much used in the preservation of subjects of natural history from insects; its powerful odour destroys the more minute species, and deters the larger from approaching, and it is also used in medicine as a sedative.

THE beautiful system of sun, planets, and comets, could have its origin in no other way than by the purpose and command of an intelligent and powerful Being. He governs all things, not as the soul of the world, but as the lord of the universe. He is not only God, but Lord or Governor: we know him only by his properties and attributes, by the wise and admirable structure of things around us, and by their final causes; we admire him on account of his perfections, we venerate and worship him on account of his government.—SIR ISAAC NEWTON.

LIVING in an age of extraordinary events and revolutions, I have learned from thence this truth, which I desire might thus be communicated to posterity; that all is vanity which is not honest, and that there is no solid wisdom but in real piety.—EVELYN'S *Epitaph by himself.*

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HEAD-DRESSES OF EGYPTIAN LADIES.

HEAD-DRESSES OF GRECIAN LADIES.

HEAD-DRESSES OF ROMAN LADIES.

ON WIGS AND HEAD-DRESSES.

No. III.

THE HEAD-DRESSES OF FEMALES.

THE arrangement of the hair, and the decoration of the head, have, in all ages, been objects of great attention among females, and the extravagance into which they have been led, in decorating this part of the person, has often been a subject of severe reproof. We meet with many instances of this in the Sacred volume, where the vanities of the Jewish women are particularly alluded to.

The Jews, originally a pastoral people, acquired a taste for this method of ornamenting the person through their intercourse with the Egyptians, and with the Asiatic nations. There are no known Jewish monuments to which we can refer, but we may gather much information on the subject from the remains of Egyptian antiquity, for there is little doubt the fashions of the Jews were mostly borrowed from the people of that nation. We have already given a representation of an ancient Egyptian wig*, but this kind of head-dress was seldom worn without a variety of ornaments being at the same time added; these consisted of fillets of gold, ribands of the brightest colours, flowers, particularly the lotus, of which they were extremely fond; in some cases feathers, together with enormous ear-rings, necklaces, elegantly painted collars, &c.

The first three figures in the engraving are head-dresses of Egyptian females. The figure to the left shows the usual mode of wearing a wig, resembling that we have already figured; the only ornament being a narrow fillet round the crown of the head. The central figure is much more gaudily attired, and was probably an assistant at some religious ceremony; in her hand she holds a musical instrument, called a *sistrum*. The feathers which surmount the head-dress are variegated with green and red, an artificial lotus forms part of the ornament, fixed in a golden support; a golden fillet binds the hair, which is black; the ornament which hangs over the shoulder is of blue and gold, and the collar is elegantly worked or painted. The right-hand figure has her head covered with a cap, of a delicate fabric, and of a bright-blue colour; the rosettes of the fillet are of gold, and the ornament that depends from the top of the head is black; the ornament is in the form of a serpent.

The next nation of antiquity to which we can refer on this subject is the Greeks, and the good taste of the Grecian ladies is eminently conspicuous in the adornment of the head. At first, as appears both from ancient sculpture and paintings, men and women alike wore their hair descending partly before and partly behind, in a number of long separate locks, either of a flat and zig-zagged, or of a round and corkscrew shape. A little later it grew into fashion to collect the whole of the hair hanging down the back, by means of a riband, into a single broad stream, and only to leave in front, one, two, or three long narrow locks hanging down separately; and this is the head-dress which Minerva, "a maiden affecting old fashions and formality, never seems to have quitted." Later still the queue depending down the back was taken up, and doubled into a club, and the side-locks only continued to reach in front as low down as the bosom. But these also gradually shrunk away into a greater number of smaller tufts or ringlets, hanging down about the ears, and leaving the neck quite unconfined. So neatly was the hair arranged in both sexes round the forehead, and in the males round the chin, as sometimes to resemble the cells of a bee-hive, and at others waves and undulations, executed in wirework.

Ladies reckoned among the ornaments of the head the tiara, or crescent-formed diadem, and ribands, rows of beads, wreaths of flowers, nettings, fillets, skewers, and gew-gaws innumerable. Ear-rings of various shapes, necklaces in numerous rows, and various other trinkets, were in great request. The Roman ladies followed, to a certain extent, the fashions of the Greeks, but they seem rarely to have worn the tiara, or the net to support the hair; their mode of dressing the hair was less elegant but more elaborate, being frequently arranged in a vast number of small curls; for this purpose they made use of a hot iron, called *calamistrum*, and this instrument appears to have been in use among the Grecian as well as the Roman ladies. Tiaras, pins, and other articles for the decoration of the head, have been found among the ruins of Pompeii. The Roman ladies, whose hair is generally black, were extremely fond of light and auburn hair, which was brought to Rome from Germany and the northern parts of Europe. Ovid, and other Latin poets, frequently allude to this practice, and to the employment of a German nostrum to cause the hair to grow,—

> Say that by age, or some great sickness had,
> Thy head with wonted hair be thinly clad;
> Falling away like corn from ripened sheaves,
> As thick, as Boreas blows down Autumn leaves.
> By German herbs thou may'st thy hair restore,
> And hide the bare scalp that was bald before.
> Women have known this art, and of their crew
> Many false colours buy, to hide the true;
> And multitudes, yea, more than can be told,
> Walk in such hair as they have bought for gold.
> Hair is good merchandise, and grown a trade,
> Markets and public traffic thereof made
> Nor do they blush to cheapen it among
> The thickest number, and the rudest throng.

The same poet also ventures to give the ladies instruction as to the dressing of their hair.

> A long and slender visage best allows
> To have the hair part, just above the brows;
> So Laodameia, surnamed the fair,
> Used, when she walked abroad, to truss her hair.
> A round plump face must have her trammels tied
> In a fast knot above, her front to hide;
> The wire supporting it, whilst either ear,
> Bare and in sight, upon each side appear.
> Some ladies' locks about their shoulders fall,
> And hanging loose, become them best of all.
> * * * * *
> More leaves the forest yields not from the trees,
> More beasts the Alps breed not, nor Hybla bees,
> Than there be fashions of attire in view,
> For each succeeding day adds something new.

* See *Saturday Magazine*, Vol. XII., p. 113.

THE LIMITED POWER OF MAN.

MAN can construct exquisite machines, can call in vast powers, can form extensive combinations, in order to bring about results which he has in view. But in all this he is only taking advantage of laws of nature which already exist; he is applying to his use qualities which matter already possesses. Nor can he by any effort do more. He can establish no new law of nature which is not a result of the existing ones. He can invest matter with no new properties which are not modifications of its present attributes. His greatest advances in skill and power are made when he calls to his aid forces which before existed unemployed, or when he discovers so much of the habits of some of the elements as to be able to bend them to his purpose. He navigates the ocean by the assistance of the winds, which he cannot raise or still:

and even if we suppose him able to control the force of these, his yet unsubjugated ministers, this could only be done by studying their characters, by learning more thoroughly the laws of air, and heat, and moisture. He cannot give the minutest portion of the atmosphere new relations, a new course of expansion, new laws of motion. But the Divine operations, on the other hand, include something much higher. They take in the establishment of the laws of the elements, as well as the combinations of these laws, and the determination of the distribution and quantity of the materials on which they shall produce their effect. We must conceive that the Supreme Power has ordained that air shall be rarefied, and water turned into vapour by heat; no less than that he has combined air and water, so as to sprinkle the earth with showers, and determined the quantity of heat, and air, and water, so that the showers shall be as beneficial as they are.

We may and must, therefore, in our conceptions of the Divine purpose and agency, go beyond the analogy of human contrivances. We must conceive the Deity, not only as constructing the most refined and vast machinery with which the universe is filled; but we must also imagine him as establishing those properties by which such machinery is possible: as giving to the materials of his structure the qualities by which the material is fitted to its use. There is much to be found, in natural objects, of the same kind of contrivance which is common to these and to human inventions: there are mechanical devices, operations of the atmospheric elements, chemical processes. Many such have been pointed out; many more exist. But besides these cases of the combination of means, which we seem able to understand without much difficulty, we are led to consider the Divine Being as the *author of the laws* of chemical, of physical, and of mechanical action, and of such other laws as make matter what it is; and this is a view which no analogy of human inventions, no knowledge of human powers, at all assists us to embody or understand. Science, therefore, while it discloses to us the mode of instrumentality employed by the Deity, convinces us, more effectually than ever, of the impossibility of conceiving God's actions by assimilating them to our own.—WHEWELL.

MUSIC

MUSIC, though now a very complete and difficult art, is, in truth, a gift of the Author of Nature to the whole human race. Its existence and influence are to be traced in the records of every people from the earliest ages, and are perceptible, at the present time, in every quarter of the globe. It is a part of the benevolent order of Providence, that we are capable of receiving from the objects around us, pleasures independent of the immediate purposes for which they have been created. Our eyes do not merely enable us to see external things, so as to avail ourselves of their useful properties; they enable us also to enjoy the delight produced by the sensation of *beauty*, a perception which (upon whatever principle it may be explained), is something distinct from any consideration of the mere utility of an object. We could have had the most accurate perceptions of the form and position of everything that constitutes the most beautiful landscape, without receiving any idea of its beauty. We could have beheld the sun setting amid the glowing tints of a summer evening, without thinking of anything beyond the advantage of serene weather; we might have contemplated the glossy expanse of the ocean, reflecting the tranquil beams of the moon, without any other feeling than the comfort of a safe and easy navigation; and the varieties of hill and dale, of shady woods and luxuriant verdure, might have been pleasant only in the eyes of farmers and graziers. We could, too, have listened to *sounds* with equal indifference to everything beyond the mere information they conveyed to us; and the sighing of the breeze, or the murmuring of the ocean, while we learned nothing from them of which we could avail ourselves, might have been heard without pleasure. It is evident that the perception of external things, for the mere purpose of making use of them, has no connexion with the feeling of their beauty; and that our Creator, therefore, has bestowed on us this additional feeling, for the purpose of augmenting our happiness. Had he not had this design, he might have left us without the sense of beauty or deformity. "If God," says Paley, "had wished our misery, He might have made sure of his purpose, by forming our senses to be as many sores and pains to us, as they are now instruments of our gratification and enjoyment; or by placing us among objects so ill-suited to our perceptions, as to have continually offended us, instead of ministering to our refreshment and delight. He might have made, for instance, everything we saw loathsome, everything we touched a sting, and every sound a discord."

In place of every sound being a discord, the greatest part of the sounds which we hear are more or less agreeable to us. The infinite variety of sounds produced by the wind and waters, the cries of animals, the notes of birds, and above all, the tones of the human voice, all affect us with various kinds and degrees of pleasure; and, in general, it may be said, that it is such sounds as indicate something to be feared and avoided, such as the howling of wild beasts, or the hissing of serpents, that are positively painful to our ears. In this sense all nature may be said to be full of music, the disagreeable and discordant sounds being (as in artificial music), in such proportion only as to heighten the pleasure derived from those which are agreeable. The human voice is that which pleases us chiefly, and affects us most powerfully. Its natural tones and accents are calculated to penetrate the heart of the listener, and the union of these to articulate speech, in every language, not only produces a melody which pleases the ear, but an effect on the feelings, of which the mere words would be incapable. These natural tones of the voice, either by themselves, or joined to articulate language, constitute music in its simplest state; and the pleasures and feelings derived from such music must necessarily have existed in every form of society.—HOGARTH'S *Musical History*.

THE USEFUL ARTS. No. XXXVI.

THE CARPENTER. 2.

WHEN a timber-tree is cut down, the branches, arms, and boughs, are cut off and the bark stripped, this being valuable for many purposes. The trunk is then sawed square, and again cut into *planks, deals, battens*, &c., as the different sized boards into which it is reduced are called.

Teak and mahogany is imported into this country in *logs*, distinguished from the long beams known technically as *timber*, by their width and thickness, being considerable, in proportion to their length.

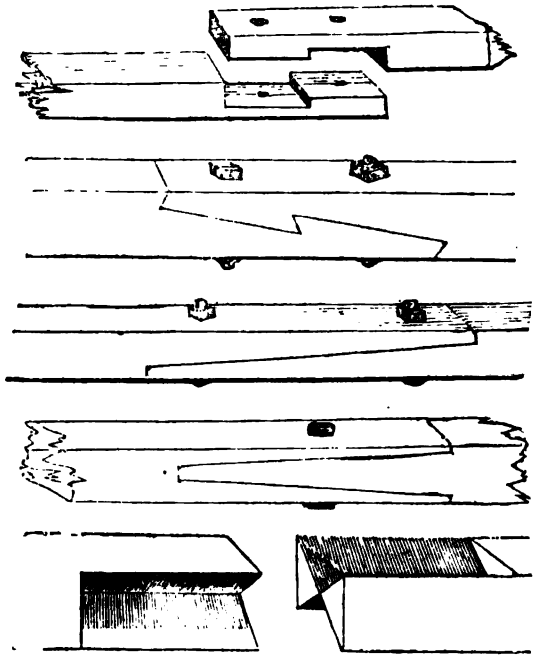
Timber is sawed in countries producing, or using it, in great quantities in saw mills, in which the tools are worked by water or steam. From four to six long saws are set parallel to each other in a frame, and at the distance apart of the thickness of the planks into which the timber is to be cut. These frames of saws are moved vertically up and down by the machinery, the timber lying horizontally on a frame-work, and being pushed gradually along by the ma-

chinery, to keep the saws in action as they cut through it, the saws always remaining in one place.

Wood is also sawed into battens, laths, &c., by circular saws, turned by machinery, like a lathe.

When timber is sawed by hand, it is done by two men acting in concert in the following manner. A pit is generally chosen, round the margin of which a stout frame is laid. The beam to be sawed is laid lengthwise to the pit on this frame, in the centre, and one man stands on the beam while another is in the pit below him, each alternately raising or pulling down a large vertical saw, with which they saw the beam lengthwise into planks. Wedges of wood are placed by them in the fissure as they proceed, to keep the cut open, and thus allow the saw to play freely. This is excessively hard labour, especially to the upper man, who has not only to raise the weight of the saw in the up-stroke, but to guide it correctly along the chalked line on the beam. This man gets higher wages, and is called the *Top-sawyer*, a term technically given in jest to any one who is, or fancies himself, of importance.

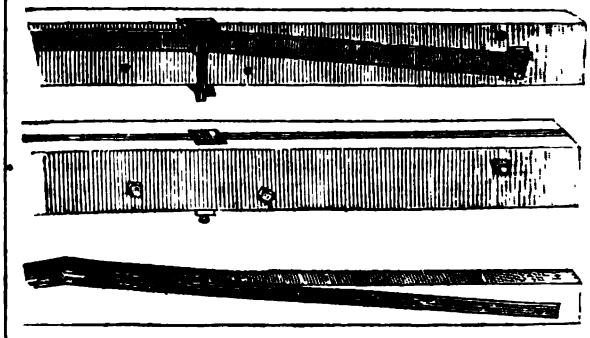
When timber is wanted in lengths exceeding those that can be procured from the tree in one piece, it must be joined by what is called *scarfing*; that is, the ends of the two lengths that are to be united into one, are cut so that a portion of the one may lap over and fit into a portion of the other which is cut so as to receive it, the timber, when united, being of the same uniform size. The joined ends are secured together by bolts or spikes. The annexed are figures of the more usual modes of scarfing timber for different purposes.



The last is a mode of scarfing invented by Mr. Roberts, of the Royal Dock Yards.

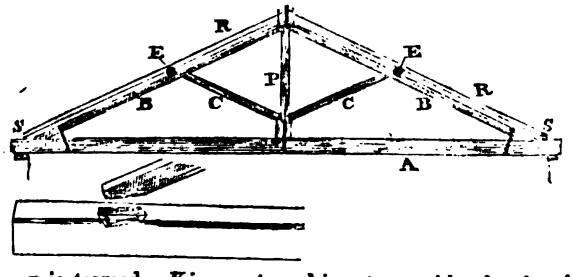
When a beam of timber is long in proportion to its breadth and thickness, it will bend by its own and will be incapable of supporting much additional weight; it may be strengthened by *trussing*, in different modes, of which we will only describe that usually adopted for girders, intended for floors. The beam is sawed longitudinally into two equal beams, each, of course, half the thickness of the original, these halves are reversed, end for end, so that if there were any weak part in the original beam, this may be divided equally between the ends of the compound beam made up of the two halves when bolted together. A flat *truss*, usually of oak, with iron *king-bolts* and abutting plates, resembling in form and principle, a timber roof or bridge, is placed between the two half beams, and let into a shallow groove cut in each half to receive it; the compound beam, with this truss in the middle, is then bolted together again by means of iron bolts with washers and nuts, and consequently becomes rigid by the construction of the truss. The truss is not entirely let into the double beam, as the full effect of strength may be obtained without the necessity for cutting the groove in each half beam, of half the thickness of the oak truss; consequently, when the girder is completed, there is a slit all along it, through which the truss is seen lying in its place between the two sides.

Iron trusses are often used instead of oak, and beams are frequently strengthened by screwing a thin flat iron truss on one or both sides, let into the beam for about half the thickness of the metal.



This mode of strengthening a beam by trussing, is only adopted in floors, where it is necessary to limit the depth of the truss to that of the beam, to obtain a level surface by means of joists laid across, and supported by, the beam. But it is obvious that much greater strength may be imparted to a long beam by making it the base of a triangular frame, as is done in roofs, in various manners, when the slanting sides of the triangular frame carry the battens or laths for supporting the tiles or other covering.

The annexed is the simplest form of a roof, and will help to explain the subject of carpentry in other respects. The beam A, called the *Tie-beam*, is of such a length as to rest on the side walls of the house at each of its ends, and is supposed to be of such dimensions in depth and thickness as would render it inadequate to support much more than its own weight. The two sloping rafters BB, are called *Principals*; they are *mortised* into the tie-beam at their ends by a joint, shown in the annexed figure, by which they are provided with a firm abutment to prevent the ends from slipping outwards, and in order to prevent the principal from starting upwards out of the mortise, it is strapped down to the tie-beam by an iron strap, bolted or screwed to both timbers.



P is termed a *King-post*, and is cut out with a head and foot, the former to receive the upper ends of the principals, which, being cut square, abut firmly against the sloping face of the head. The sloping principals hold up the king-post, and the tie-beam is supported from the latter by a stirrup-shaped strap, that goes under the beam and is bolted, or screwed, to the post on each side. To prevent the principals from bending by the strain, or by the weight of the roof-covering, the struts C C, are placed, abutting against the beveled part of the foot of the king-post, and are strapped to the principals, or mortised into them.

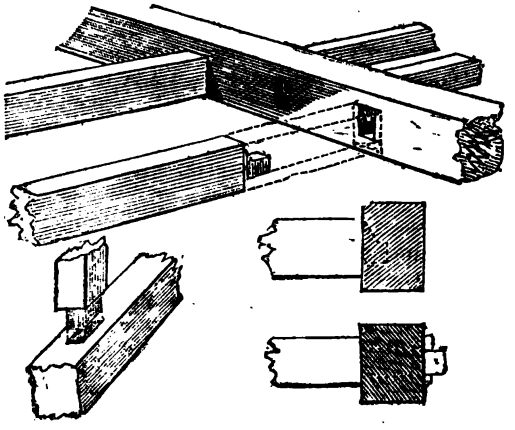
The number of tie-beams with their trusses, &c., of course depends on the length of the roof, or the material with which it is to be covered. A longitudinal *scantling*, or thin beam, called a *purline*, E, is laid lengthwise, resting on the principals over the ends of the struts, and is secured to the former by a spike, or else by being notched down on to the principal. These purlines support the common rafters R, which abut at their feet against a longitudinal scantling S, lying on, and *halved* down on, the tie-beams; at their upper ends, the rafters R rest against a *ridge-piece*, or thin plank, let edgeways into the head of the king-post. The rafters are placed about a foot apart, and on to them are nailed the laths or battens to carry the tiles or slates.

In constructing roofs, floors, and other structures of timber, the various beams are *framed*, or fastened together by certain processes calculated to insure strength and per-

manence in the framing, which ought to be understood, and their names remembered.

The *Mortise* and *Tenon* is used when one beam is to be attached to, and supported by, another, without resting on it, but so that the beams may be in the same plane. The mortise is a hole cut into, or through, the side of the one beam, into which hole the end of the other, cut down to fit the form of the hole, is inserted and fastened. It is obviously necessary to consider two things in determining the size and form of the mortise and tenon. First, that by the former the one beam may not be too much weakened, and yet that it should be large enough to give the tenon that fits into it, sufficient strength to enable the beam to carry the weight intended.

If the one beam is horizontal, and the other to stand perpendicularly upon it, the tenon need only be large enough to retain the upright beam in its place. The annexed are the most usual forms of mortises and tenons, and will explain their use and principle.

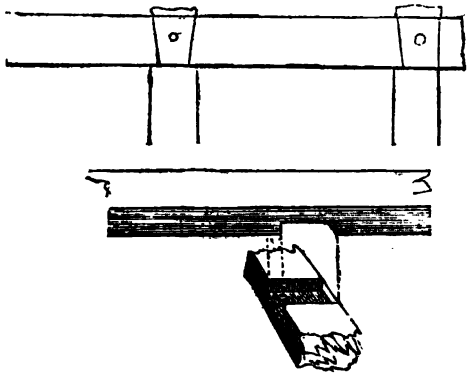


It is obvious that two mortises never should come opposite each other on the two sides of the same beam.

When the tenon comes through the beam, it is secured from drawing by a pin or peg put through it.

The *Dovetail* is used to secure one beam into another, when they have to resist any strain acting to draw them asunder, rather than to carry any weight; it is consequently employed to frame wall-plates, or the timber laid in walls to carry the ends of beams of floors, roofs, and so on, which plates tend to bind the walls together as well as receive the ends of the beams. The term is derived from the end of one beam being cut into a shape resembling the spreading tail of a bird which is pinned down in a corresponding wedge-shaped recess cut in the other beam to receive it. It is clear from this construction that no force, acting in the direction of its length, could pull the first beam out of the second without breaking off the dovetail, which the tenacity of wood-fibre renders nearly impracticable in one of any size. The dovetail is extensively used in all cabinet-making, and may be seen in any mahogany or deal-box better made than a common packing-case.

When two beams of equal thickness are required to cross one another and to lie in the same plane, they are *halved* together; that is, a notch is cut in each of half the thick-



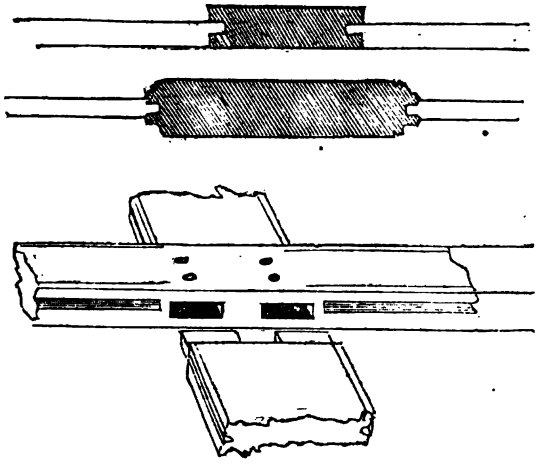
ness of the other, then the uncut part of each lies in the notch of the other respectively, and the two are pinned together

The smaller and better kind of work executed by the Carpenter is called *Joiner's work*, such as the making of doors, windows, stairs, wainscotting, boxes, tables, &c., &c., which are usually formed of yellow or Norway deals, wainscot, or else mahogany.

When a large surface is to be of wood, it is not formed of planks fixed together side by side till the requisite width is attained, but it is formed of *framing* and *pannelling*. A frame-work, of the area required to be covered, is formed of narrow planks, with cross-bars between to strengthen the frame; these are called *stiles* and *rails*, according to the directions in which they run, the former name being given to the upright planks of the frame, while the horizontal ones are called rails.

The rails are mortised into the stiles, and the tenons, since they must be comparitively thin, are made proportionably wide, nearly as wide as the rail. The tenons are always pinned into the mortise holes by one or two wooden pins driven quite through the stiles and through the inclosed tenon.

The edges of the stiles and rails are *ploughed*, that is, a rectangular furrow is cut in the edge by means of a plane, to receive the ends and sides of the *panels*. These panels are formed of thinner deals than the stiles and rails, and are made by glueing the edges of two or more boards together to make the proper width of the panel, the ends and edges of the panel are thinned off to fit into the groove or furrow in the stiles and rails, or else the ends and sides of the panel are *rebated*, that is, worked by a plane into the form shown in the annexed figure, the projecting part being received into the furrow.



As the panels are thinner than the frame, the former constitute so many recesses, at least on one side of the framing; and a small moulding is glued round the edge of the panel to form a finish to the work. Or else the same object is attained by working the edge of the stiles and rails with such a moulding, so that when the panel is put in, the moulding may finish against it. Sometimes the face of the panel is made to lie in the same plane with the face of the stiles and rails, and the panel is then said to be *flush*, and the edges of the stiles, &c., are finished with a small bead, also flush with the panel when finisned.

In joiner's-work the whole surface of the work is made perfectly smooth by *planing* the material, and allowance must be made for the reduction in thickness and width of the wood, produced by this planing, in the choice of the rough material.

All mouldings in wood are worked out by planes made of the proper form, to leave the moulding in the wood when the plane has been passed over the part. The carpenter and joiner consequently require a vast variety of planes for these purposes, which constitute the most expensive part of the expensive tools used by these workmen. These planes receive their names from the form they are intended to produce in the wood, such as *rebating* planes, O G planes, ovolo-planes, beading-planes, and so on.

NATURE has perfections in order to show that she is the image of God, and defects in order to show that she is only his image.—PASCAL.

THE ANCIENT OFFICE OF PURVEYOR TO THE KING.

THE office of Purveyor to the royal household, at the present day, is very different in its character from that which was formerly exercised under the same name. The Purveyor of modern times is nothing more than a tradesman who serves the king precisely as he would serve any other customer, and generally at as cheap a rate; the Purveyor of ancient days was an officer employed to enforce a very obnoxious prerogative, and for that purpose armed with a large share of power, which he generally contrived to abuse to his own profit and the great oppression of his fellow-subjects.

The "profitable prerogative of purveyance and pre-emption," as Blackstone calls it, was a right enjoyed by the crown of buying up provisions and other necessaries by the intervention of the king's Purveyors for the use of the royal household, at an appraised valuation, in preference to all others, and even without consent of the owner; and also of forcibly impressing the carriages and horses of the subject to do the king's business on the public roads in the conveyance of timber, baggage, and the like, however inconvenient to the proprietor, upon paying him a settled price. This prerogative prevailed pretty generally throughout Europe during the scarcity of gold and silver. In those early times the king's household was supported by specific venders of corn and other victuals, from the tenants of the respective demesnes

Many lands were from time to time granted to individuals, on condition of their yielding to the king certain supplies of provisions; the reservations, however, were often small, and many of them only to be rendered when the king travelled into the country where the lands lay. In some cases special care was taken that he should not make the service burdensome by paying his visits too often; as in the case of William, son of William Alesbury, who held lands in Alesbury, upon the tenure of finding amongst other things, three eels for the king when he should come to Alesbury in the winter, and two green geese in the summer; the number of visits, however, not to exceed three in the year.

There was also a continual market kept at the palace-gate to furnish viands for the royal use. This was superintended by an officer called "Clerk of the Market of the King's House," who was to burn all false weights and measures, to precede the king in his progresses, and warn the people to bake and brew and make provision against his coming, and by the oaths of twelve men to set the prices of provisions, beyond which no persons attending the court were to pay.

These arrangements answered all necessary purposes in those times, so long as the king's court continued in any certain place. But when it removed from one part of the kingdom to another, (as was formerly very frequently done,) it was found necessary to send Purveyors beforehand, to get together a sufficient quantity of provisions and other necessaries for the household: and lest the unusual demand should raise them to an exorbitant price, the powers above mentioned were vested in these Purveyors, "who in process of time greatly abused their authority, and became a great oppression to the subject, though of little advantage to the crown."

The king's butler had a right to choose for the king two hogsheads of wine out of every merchant's ship laden with wine, one in the prow, the other in the poop, paying to the merchants only twenty shillings each; he might take more if he would at a price to be fixed by the king's appraisers. Purveyance, however, was to be made between sun and sun, and nothing was to be taken in the highway. Hides, leather, and other necessaries were taken for making the king's saddles; beans and pease for his horses. Lord Coke says, that meat and drink could be taken by the king, only when in his progress, and that in his standing-house he could not take beer, ale, or bread, being manufactured; but malt, having the substance of barley remaining, might be taken.

In the reign of John, the abuses of purveyance had risen to such a height that they were made the subject of three articles of Magna Charta, which the barons obtained from that monarch at Runnymede. By the first, the constable or bailiff of a castle was restrained from taking corn or other chattels of any man not of the town where the castle was, without making immediate payment, unless the seller agreed to wait; but if the seller was of the town, three weeks were allowed for payment by the first confirmation of this charter in the beginning of the reign of Henry the Third. By the 30th article of John's charter, no sheriff or bailiff of the king, or any other, was to take any man's horses or carriages but by his consent; the subsequent charters add, "but at the old prices limited, namely, a carriage with two horses tenpence a day, with three horses fourteenpence a day." The 31st chapter of John's charter prohibited the taking of any man's wood for the king's castles or other necessaries, without the owner's consent; and this was confirmed by the subsequent charters. It appears, nevertheless, that the practice of taking the wood continued, and that money was extorted from the owners by demanding such as grew about the mansion-house and could ill be spared.

It appears by the statute of Westminster, passed in the third year of Edward the First, that Purveyors used to enter houses under colour of buying for the king, break the doors, locks, and windows, and thrash out and carry away the corn, and that they paid no more regard to the houses of prelates than to those of the laity. Edward the Second, in his sixteenth year, sent his writ to the justices of the King's Bench, commanding them to punish the infringers of the statutes upon this subject; but the steward of his household continued to exercise his power of purveyance with a high hand even in the city of London, notwithstanding the great privileges of that place; for in the eighteenth year of Edward's reign, he commanded that no fishmonger, on pain of imprisonment, should go out of the city to forestall any sea or fresh fish, or send them to any great lord or religious house, until the king's Purveyors should have made their purveyance for the king.

In the fourth of Edward the Third, an act reciting that the king, queen, and their children, oppressed the people by not paying for corn, hay, and cattle, and other "vittailes" which they took, and by taking twenty-five quarters of corn for twenty, measuring by heap, and taking hay and litter at less than the value; directs accordingly that nothing be taken without consent of the owner, that corn be taken "by the strike as men use throughout the kingdom," and that the things be taken at their true value by constables and other good men of the vill who should not be enforced by menace or duress to assess any other price than their oath would allow.

No severity of law, however, could restrain the rapacity of these plunderers; and in the twentieth year of Edward the Third, several Purveyors were attainted and hanged for offending against the statutes. Yet in spite of this example, it was found necessary

five years afterwards to pass another act; from which we learn that one of the frauds practised by these "harpies," as Queen Elizabeth called them, "was the taking of sheep between Easter and St. John with their fleeces on, keeping them till shearing time and then taking the fleeces to their own use. A petition of the Commons in the 28th of Edward the Third, sets forth that the Purveyors of the king, those of the queen, and those of the prince, would come successively to the same house, which they complain of as too grievous. This petition, and an act of the same year, explains another oppression. Purveyors were ordered to pay by tallies; these they gave payable at such distant places, that, as the act says, people spent their value and double in going after the money.

In the 36th of Edward the Third, some very important regulations were made for correcting the abuses of purveyance. According to Sir Edward Coke, this act was passed in consequence of a Latin work addressed to the king, by Simon Islip, Archbishop of Canterbury, sharply inveighing against the intolerable abuses of Purveyors and purveyances, and earnestly pressing and advising him to make remedies for those insufferable oppressions and wrongs offered to his subjects. It, however, was doubtless in a great measure the effect of a very strong petition of the Commons.

A very curious illustration of the abuses of purveyance, and the unblushing impudence of Purveyors in the reign of Edward the Sixth, is afforded to us in an account of the behaviour of one William Pallet, deputed Purveyor for the King's Majesty's provision of poultry, &c., in the town of Cambridge. It appears that Mr. Pallet exercised his powers so harshly as to excite a disturbance among the people of the town, and to render necessary the Vice-Chancellor's interference to pacify them. Instead of taking the provisions at prices fixed in the manner required by the statutes, he took everything at his own price; and what was worse, he took the liberty of purveying for his friends as well as for the King's Majesty, very candidly confessing that if he could not do the one he would not do the other. The bold air of effrontery which this man put on, when detected, shows pretty clearly how secure he must have felt of being supported by the court, which in those days was seldom disposed to permit any interference with the prerogative even when abused. When it was proved before his face that he had taken a pheasant and other birds in the king's name, and then sold them to different persons, he answered that he had done so to gratify some friends, and openly affirmed with an oath, that unless he might do his friend's pleasure in the execution of his office, he would not serve the king in it.

The Vice-Chancellor's reasonable request, that he would use his commission discreetly, and that when he had full passage in all the surrounding country, he would spare the market of the town, except he saw a pheasant or anything else fit for the king's table, was treated by Mr. Pallet in the most unceremonious manner; for he contemptuously cast his commission to the Vice-Chancellor and commanded him to go and serve it himself. He then sent up a false certificate to his master, accusing the Vice-Chancellor of having said that he should be sued before the king and not suffered within the market. When his master's son was sent down purposely from the court to inquire into this alleged ill-treatment of a royal Purveyor by the officers of the university, Pallet was unable to substantiate his charge; but his effrontery did not desert him, for while he was before the Vice-Chancellor and his assistants, he boldly commanded a justice of the peace of the university to go and provide him his horse for his carriage, although he knew the mayor's officers to be always ready to satisfy his wants in that respect. The next manœuvre of this unscrupulous rogue was to cease sending up his provisions for a whole day, in order to bring the officers of the university into displeasure by causing it to be supposed that they had stopped him, when in fact he was all the day bragging at taverns and alehouses in the town, and threatening that he would shortly cause some officers and justices of the university to be set in the marshalsea. After this example of the treatment which so powerful and privileged as the university experienced at the hands of a royal Purveyor, under such a monarch as Edward the Sixth, the reader may form some estimate of the hardships which the "kinges pore subjects" in general must have endured from the same quarter.

In the beginning of the reign of Queen Elizabeth, some of the counties, to avoid the trouble which they had in procuring their money for goods taken by the Purveyors, and which arose, in a great measure, from the many offices, cheques, entries, and comptrolments through which the accounts were to pass, petitioned her to accept the value in money to be yearly paid by the counties. Philips says that she would not hearken to this, but did afterwards come to an agreement, fixing the proportions which several counties should yearly afford in oxen, calves, muttons, poultry, corn, &c.; and that this agreement continues in force during her reign and that of her successor, James the First. In regulating these proportions, the principal burden was imposed on the counties adjacent to the metropolis, they deriving the most benefit from the royal residence; and Philips says that they could well afford to bear it, as their rents in the time of Charles the First were improved to twenty times more than they were in the reign of Henry the Seventh, and ten times more than they were in the eighteenth year of Elizabeth's reign.

But though Elizabeth would not grant the request of the counties that she would accept money instead of provisions, she hanged one of her Purveyors in her thirty-second year for forcibly taking provisions without paying for them. Prosecutions were also carried on in the star-chamber against some of her Purveyors; but she ordered Sir Thomas Egerton, the Lord Keeper, to stop the proceedings, as being an encroachment on the prerogative royal in her household, and commanded that the matter should be heard before the Lord Buckhurst, Lord Treasurer; the Earl of Nottingham, Lord High Admiral; Sir John Fortescue, Chancellor of the Exchequer, (being the commissioners for household causes,) Sir William Knollys, Comptroller of the Household, and the rest of the officers of the Board of Green Cloth, in the Compting-house; and the cause was heard there accordingly.

In Elizabeth's time, too, great complaints were made by the city of London, that the Purveyors took the first carts they could find, and frightened away those persons from the country that used to bring provisions; whereupon, a regulation was made that the carts in London and resorting to it should serve the Queen four times in a year, and the management of the matter was entrusted to the governors of Christ's Hospital.

When Elizabeth was at Nonsuch, in Surrey, her Purveyor of coals used to make out a warrant to the high constables of some Rape in Sussex, to warn carts for the carriage of coals to Nonsuch, appointing a meeting with them to receive the returns on

the warrants. Sometimes the carts went to the places appointed but found no coals to carry; in general, however, it was well understood that the principal object was the preliminary meeting, at which the Purveyor would assign the parties over to a person whom he took with him, to compound for their carriages. This man would take twelve shillings for every load; and he at last raised the sum to fourteen shillings. The justices of Sussex complained of this to the Board of Green Cloth in 1598.

In 1604, soon after the accession of James the First, the Commons determined on a representation to the king of the grievances occasioned by the Purveyors; and Sir Francis Bacon made a long speech on the subject to the king, in the withdrawing chamber at Whitehall.

There was no grievance, (he told the king,) in his kingdom so general, so continual, so sensible, and so bitter to the common subject as that which he was then speaking of. They did not pretend to derogate from his prerogative nor to question any of his regalities or rights; they only sought a reformation of abuses, and a restoration of the laws to which they were born. He complains that the Purveyors take in kind what they ought not to take; they take in quantity a far greater portion than cometh to the king's use, and they take in an unlawful manner. They extort money in gross or in annual stipends, to be freed from their oppression. They take trees, which by the law they cannot do; timber trees which are the beauty, countenance, and shelter of men's houses; that are a loss which men cannot repair or recover. If a gentleman is too hard for them whilst at home, they will watch him out and cut the tree before he can stop it. When a poor man hath his goods taken from him at an under value, and cometh to receive his money, he shall have twelvepence in the pound deducted; nay, they take double poundage, once when the debenture is made, and again when the money is paid.

He tells the king also, that "there is no pound of profit to him. but begetteth three pound damages on the subject, besides the discontent." By law, the Purveyors ought to take as they could agree with the subject; by abuse they took at an enforced price.

By law they ought to make but one apprisement by neighbours in the country; by use they make a second apprizement at the court-gate; and when the subjects' cattle come up many miles, lean and out of plight by reason of great travel, they prize them anew at an abated price. By law they ought to take between sun and sun; by abuse they take by twilight and in the night. By law they ought not to take in the highway, by abuse they take in the ways. This abuse of purveyance, if it be not the most heinous abuse, yet it is the most common and general abuse of all others in the kingdom.

We have other testimony to the abuses arising from purveyance at this period, in the curious confession made by one Richards, when he was examined before the Star-chamber, of the rogueries practised by him and his brethren. He said that they charged ten times the quantity wanted, sold the surplus, and shared the money. They went to the most remote places to make their purveyance, in order to induce the people to come to a composition. They conspired with the high-constables to charge more than enough, and took half the money of them, but gave receipts for the whole, the constables taking the rest. The clerk of the market set the prices below the value and shared the gain. This confession did not, however, save the culprit, who had likewise extorted money under pretence of having a grant for compounding fines on penal statutes, and he was sentenced to stand in the pillory in Westminster, in Cheapside, in three market towns of Dorsetshire, and in three of Somersetshire,—to lose one ear at Dorchester, the other at Wells,—to ride on a horse with his face to the tail, and papers pinned on him, expressing his crime,—to pay a fine of one hundred pounds,—and to be imprisoned during the king's pleasure.

In the reign of Charles the First, a dispute arose concerning the right which that monarch claimed of digging anywhere for saltpetre, in order to provide gunpowder for his troops. The judges allowed the claim; they held that the king could not "prescribe" for the right, because the art of making gunpowder was brought into England within memory, viz. in the time of Richard the Second, yet, as the same concerned the defence of the realm, the king might take sufficient for that purpose in the nature of purveyance.

During the Commonwealth the powers of purveyance fell into disuse; and, in 1661, after the Restoration, the grievance was wholly abolished by the 12th of Charles II., the Parliament at the same time granting to the king, in satisfaction of the interest which he conceded, a certain tax upon beer. In the following year, however, the statute was temporarily relaxed in favour of the king's royal progresses, by an act empowering the clerk, or chief officer of His Majesty's carriages, by warrant from the Green Cloth, to provide carts, &c. for His Majesty's use, and persons refusing to serve were made liable to a penalty. Philips says that it was the want of the ancient purveyance which prevented Charles the Second from making a progress which he had designed into the country in the Summer of 1661.

We shall conclude in the words of Mr. Bray, from whose paper on this subject, in the *Archæologia*, we have derived most of our information.

Thus have we taken some view of the rise, progress, and extinction of an office which subsisted for ages, without producing to the crown a return at all adequate to the burdens it imposed on the subject. We see Archbishop Islip's words fulfilled; the abolition of purveyance has not occasioned any want of provisions in the king's house, and instead of his people flying from his approach, they fly to meet and welcome him whenever he visits the country.

A WARNING VOICE IN LONDON.

In London town wags many a tongue,
And nonsense much is spoken;
In London many a lie is told,
And many a promise broken.

But there's a tongue in London town
Whose voice is grave and true;
Ancient as Time the tale it tells,
And yet 'tis always new.

Solemn and loud above the crowd
It booms both night and day;
You hear it when you're close at hand;
You hear it, miles away.

Measured and grave the note it sounds
O'er Middlesex and Surry;
It lingers not for lagging souls,
Nor hastes for those who hurry.

By day while all the world's agog,
Amid the city's humming,
"Mortals," it cries, "Time flies apace,
Eternity is coming!"

By night while wearied folks repose,
Unwearied still and waking,
That solemn warning it repeats
The night's dread stillness breaking.

St. Paul's! Thou hast an awful voice,
But may I never fear it;
Ev'n when thou toll'st my dying hour
May I rejoice to hear it.—D. D. S.

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THE RHINE. No. VI.

JOHANNESBERG CASTLE.

JOHANNESBERG, AND THE WINES OF THE RHINE.

COME with me, your faithful friend,
On the wings of thought along,
To where the Rhine his course does bend
Rich vine-covered hills among;
To his mountains tempest-braving,
Isles with gayest verdure clad,
Fields with yellow harvest waving,
And his woodlands wide outspread.

IN former papers, we have taken occasion, in describing portions of the scenery of the Rhine, to speak of the vines which are so largely cultivated upon its banks, and to which the fancy of those who have never seen them assigns a larger share in the formation of its picturesque attractions than they are entitled to. In the minds of most persons the Rhine and the vine are inseparably associated; indeed, the appellation of "Father of Wine," which the Germans have fondly bestowed upon this magnificent river, bespeaks as close a connexion between the two things, as the rhymes of poets have established between the two names.

The wines of the Rhine are chiefly produced along that part of its course which lies between Mentz and Coblentz, and throughout which the river is for the most part confined on both sides by lofty banks, whose light porous soil and rocky substrata furnish the most favourable sites for the cultivation of the grape. The choicest produce is, however, limited, not only to a particular part of this course, but also to one side of it; namely, that fertile and beautiful district of Nassau, which stretches from the Taunus hills to the northern or right bank of the river, and is known by the name of the Rheingau*.

Among the wines of the Rheingau, the first place is, by common consent, yielded to those which are produced on the far-famed domain of Johannesberg.

This golden hill, (says the Baron von Gerning,) is the crown of the Rheingau, in the midst of which it is most picturesquely enthroned. In its vicinity, we feel ourselves in the very heart of the far-famed Rhine-land. We ascend imperceptibly this detached vine-hill, which is protected towards the north-east by the wood-covered Rabenkopf, and towards the north by the Taunus mountains. Behind the priory on the same hill, lies the town or village of Johannesberg, formerly a colony of servants belonging to the establishment; and at the foot of the hill facing the river, lies the little village of Johannesgrund, and also a nunnery called the Klause, connected with the abbey by a subterraneous passage, which was founded in 1109 by Richolf, the last Rhinegrave, in honour of St. George, the then patron of the crusaders. The top of the castle commands a most beautiful view of the Rhine, from Biebrich to Bingen, over the nine islands and the twenty intervening cantons. Slender elms adorn the foot of the golden hill, which was an allodial possession belonging to the archbishopric of Mentz, before the Rheingau came into that see, and before it received the name of Bischoffsberg.

According to the general account, Rhabanus Maurus, previously Abbot of Fulda, first planted this vine-hill, and built a chapel here, dedicated to St. Nicholas; it is also said that he was here elected Archbishop of Mentz in 847. This account, however, rests upon scarcely sufficient authority; it is a fact

* See *Saturday Magazine*, Vol. XII., p. 105.

better established, that, in the year 1106, Ruthard, Archbishop of Mentz, founded a Benedictine convent upon this hill, and dedicated it to St. John; the convent became enriched with additional endowments until about 1130, under the archbishop Adelbert, it was transformed into a Benedictine abbey.

During the turbulent times of the middle ages, this abbey suffered severely from the calamitous wars to which the country around was constantly exposed; and even in the page of modern history its misfortunes have been recorded. In 1525, during the war of the Boors, it was greatly injured; and seven-and-twenty years afterwards, it was plundered and burnt down by the markgrave, Albert of Brandenburg. It was afterwards restored, but again in 1631 was destroyed by the Swedes, whose dreadful ravages in Germany are still to be traced at the present day. In consequence of these various misfortunes, the establishment became involved in debt, and was abandoned after having been mortgaged for twenty thousand rix-dollars by the archbishop, Elector of Mentz, Anselm Casimir, to Hubert von Bleymaun, treasurer of the empire. The Benedictines soon became very anxious to regain their old possession; but in the mean while the mortgage had risen to thirty thousand rix-dollars, which it surpassed their ability to produce. Fortunately, however, they found a powerful supporter in the Prince Bishop and Abbot of Fulda, who was of the same spiritual fraternity with the monks of Johannesberg; that dignitary, after a dexterous negotiation at Mentz, succeeded, in 1616, in recovering their abbey on payment of the mortgage and an additional sum. Instead, however, of being restored to its conventual state, it was converted into a priory.

About the same time, the modern castle or palace was built by the prince bishop; and two of the ecclesiastics belonging to Fulda constantly resided here. Portraits of five bishops are to be seen in one of the apartments; from which also a view is obtained of the mountains of Fulda. Underneath is a cellar, which is said still to exhibit the traces of an attempt made by the French to blow up the edifice in 1796, on account of arrears of contribution,—"An attempt" says Von Gerning, "which would have been realized but for the vigorous interference of the honest bailiff of Rüdesheim, who, on this occasion, spoke his mind in bold German to the plundering general of the hostile forces." Among other things the bailiff said, "On beholding these ruins the passing traveller will exclaim with execration, 'This was done by that general.'" The French had emptied the cellars of their wine in the year 1792, when they crossed the Rhine as the bestowers of freedom.

Johannesberg remained in the hands of Fulda until 1802; for three years longer it was possessed by Orange Fulda; and then, in 1805, it passed into the possession of the French, who kept it till the end of the war which liberated Western Germany in 1813.

It was at length, (says Von Gerning,) taken possession of by Austria in 1815; and on the 1st of August, 1816, one hundred years after it came into the hands of Fulda, Prince Metternich, the Oxenstiern of our day, received it as a fief, burdened with an annual duty of the tenth part of the wine produced, by way of reward for his patriotic services

The situation of Johannesberg is remarkably fine; it has a delightful southern aspect, and commands an extensive and charming view over a fertile and varied tract of country. The hill contains about sixty acres of vineyard; and attached to it are seventy acres of meadow, four hundred and fifty acres of arable land, and four hundred of forest land, the sovereignty of which belongs to Nassau. The vines consist mostly of *riesslinge*, which impart the particular flavour that characterizes this "German Tokay;" they are small round grapes, sweet and savoury, and of a whitish-yellow colour. The wine itself is described as being "of a gentle heat, mild and strong at the same time, and uniting all the good qualities of the juice of the grape, which are heightened by a late vintage, that generally takes place in the beginning of November, after the grapes have been completely ripened by the frost."

The *riesslinge* is the plant generally cultivated in the Rhinegau; it requires a warm exposure. In some places an Orleans grape is grown, and produces a wine which is much esteemed for its peculiar flavour and aroma. The vintage is performed in the most careful manner, and at as late a period as the climate and season will permit. For the white wines, which constitute by far the greatest proportion of those made in Germany, the grapes are separated from the stalks and fermented in casks, by which means the aroma is fully preserved. The wine is freed from the lees by successive rackings, and when sufficiently clarified, is introduced into tuns where it is allowed to mellow, and continues to improve during a long term of years. Those used in the Rhinegau commonly hold eight *ohms*, or three hundred and twenty-eight gallons; but in other parts of Germany they are of larger capacity. Formerly the great proprietors vied with each other in the magnitude of the vessels in which they collected and preserved the produce of their vines: and as the better growths are valued in proportion to their age, the stock of wines in the cellars belonging to the princes, magistrates, and richer order of monks, was often enormous. Most persons have heard of the Heidelberg tun*, and other immense casks in which they have been kept for whole centuries.

At the beginning of this century, (says a native writer,) Germany saw three empty wine casks, from the construction of which no great honour could redound to our country among foreigners. The first is that of Tübingen, the second that of Heidelberg, and the third at Grüningen, near Halberstadt; and their dimensions are not greatly different: the Tübingen cask is in length twenty-four, in depth sixteen feet; that of Heidelberg thirty-one feet in length and twenty-one deep; and that of Grüningen thirty feet long and eighteen deep. These enormous vessels were sufficient to create in foreigners a suspicion of our degeneracy; but to complete the disgrace of Germany, in the year 1725 a fourth was made at Königstein larger than any of the former.

Dr. Henderson remarks, however, that such a mode of preserving certain vintages is not so absurd as some writers have imagined; for the stronger wines are undoubtedly improved by it to a greater degree, than they could have been by an opposite system of management. But in practising this method, it is essential in the first place to keep the vessel always full; and secondly, when any portion of the contents is drawn off, to replace it with wine of the same growth, or as nearly resembling it as possible. When such cannot be had, the vacant space may be filled up by introducing washed pebbles into the cask. The wine which Keysler drank, from a tun which bore the date of 1472, had become thick and acid, because these precautions were neglected. Had it been kept in bottle, this degeneration probably would not have taken place. For the more delicate growths, however, it is said that small vessels are certainly preferable.

The wines of the Rhine, (says Dr. Henderson,) may be regarded as constituting a distinct order by themselves. Some of the lighter sorts, indeed, resemble very much the

* See *Saturday Magazine*, Vol. III., p. 140.

vins de graves[*]; but in general they are drier than the French white wines, and are characterized by a delicate flavour and aroma, called in the country *gäre*, which is quite peculiar to them, and of which it would, therefore, be in vain to attempt the description. A notion prevails that they are naturally acid; and the inferior kinds no doubt are so: but this is not the constant character of the Rhine wines, which in good years have not any perceptible acidity to the taste,—at least not more than is common to them with the growths of warmer regions. But their chief distinction is their extreme durability, in which they are not surpassed by any species of wine.

The Rhine wines often possess the valuable quality of durability when they have little else to recommend them. As they are capable of almost indefinite duration, and as their flavour and aroma are always improved by long keeping, it becomes of essential importance to determine the respective characters of the different vintages for a more extended period than is necessary in the case of most other wines. In favourable seasons the growths of the Rhine are free from acidity, but in bad seasons they contain an excess of what is called malic acid, and are, consequently, liable to the imperfections attendant upon the presence of that ingredient; and as the moisture of a northern Autumn often obliges the grower to gather his grapes before they have attained their full maturity, it is evident that a large proportion of the vintages must be of this description. Hence the wines which have been made in warm and dry years, such as that of 1811, or the year of the comet as it is sometimes called, are always in great demand, and fetch exorbitant prices. Of preceding vintages, those of 1802, 1800, 1783, 1779, 1766, 1748, and 1726, are reckoned among the best, and among them that of 1783 is the most highly esteemed.

Of the Johannesberg wine, the choicest produce is that called Schoss-Johannesberger, which is indebted for its celebrity to its high flavour, and the almost total absence of acidity from it. In former days, when the domain was the property of the Bishop of Fulda, this precious wine was very rare, and it was only by favour that a few bottles of the prime vintages could be obtained from his lordship's cellars. During the changes which occurred in the early part of the present century, a considerable quantity of the wine found its way into the market. A portion of that which grows at the foot of the hill is always to be had; even this is said to be preferable in point of flavour to most of the other Rhine wines, and bears a high price.

Next to the Johannesberger may be ranked the produce of the Steinberg vineyard, which belonged to the suppressed monastery of Eberbach, and is now the property of the Duke of Nassau. It is the strongest of all the Rhine wines, and in favourable years has much sweetness and delicacy of flavour; the vintage of 1811 has been sold on the spot at as high a price as five florins and a half, or half-a-guinea the bottle. The whole quantity made is about 300 hogsheads, of which 60 are of first-rate quality. Some persons, however, dispute the claim of the Steinberg to rank second among the wines of the Rheingau, placing before it the Rüdesheimer wine, which grows on a hill opposite to Bingen, whose acclivity is so steep, that its face has been, to a great extent, formed into terraces, to which the requisite quantity of vegetable mould and manure is carried up in baskets. The Orleans grape is that chiefly cultivated, yielding a wine which combines a high flavour with much body, and is freer from acidity than most of the other growths of the Rhine. This is partly attributed to the favourable exposure, which allows the grapes to ripen fully, and also to the lateness of the vintage, which seldom commences till the end of October or the beginning of November.

The vineyard of Grafenberg, which formerly belonged, as well as the Steinberg, to the wealthy convent of Eberbach, but is of much less extent than that, is still distinguished for the choiceness of its growths. The produce of Markebrunne, in the same neighbourhood, and that of Rothenberg, near Geisenheim, are highly prized for softness and delicacy of flavour. All these wines are white. The only red wine worthy of notice among the wines of the Rhinegau is grown at Asmanshausen, a little below Rüdesheim; in good years it is scarcely inferior to some of the better sorts of Burgundy; but the quantity produced is small, and inferior wines are often substituted under its name. The grapes from which it is made are small, and of a blue colour; Charlemagne is said to have brought the first vines bearing it from Burgundy.

In speaking of the Rhine wines, it is necessary to mention those of Hochheim, which, though obtained from vineyards lying on the banks of the Maine, are usually classed with the Rhine wines, as being of like nature, and nearly of the same excellence. Indeed all the best sorts of the Rhine wines have long been confounded in our country under the general name of Hock, and Rhenish has become the distinguishing term of disrepute for inferior growths. "The Hochheimer," says Dr. Henderson, "is, strictly speaking, a Maine wine; but a corruption of its name has long furnished the appellation by which the first growths of the Rhine are ususally designated in this country." *Hock* is a contraction of Hockamore, which again is evidently an English corruption of Hochheimer.

The little town (says the Author of *An Autumn near the Rhine*), is surrounded by vineyards, with scarcely a tree to obstruct a single ray of sun; but the choice wine of the place, which every alderman flatters himself he drinks, is produced on a little hill of about eight acres, behind the ancient deanery, which seems formed to court the sun, and is protected by the town from the north winds. Each acre contains about 4000 vine-plants, valued at a ducat each; and the little hill produces, in a good year, about twelve large casks of wine, each of which sometimes sells for 1500 florins. (nearly 150*l.*) Hochheim was presented by Buonaparte to General Kellerman.

According to Dr. Henderson there are two vineyards at Hochheim, which yield the first-rate wine; they were both in former times the property of the deans of Mentz. Their united extent does not exceed twenty-five or thirty acres; but the surrounding lands yield an abundant produce, which, as in the case of other wines, often passes for the first-rate. The soils are composed of a white or brown marle, mixed with fine gravel, and reposing in some places on strata of coal, which in hot and dry seasons is said to impart a particular flavour to the wine.

Some of the Rhine wines fetch exorbitant prices, especially those of celebrated vintages. The Baron von Gerning says, that a cask of Johannesberg wine, containing eight *ohms*, or 328 gallons, particularly of the vintage of the "comet year," 1811, often sells for from 3000 to 4000 florins, or from 333*l.* to 444*l.* sterling, which is at the medium rate of nearly 24*s.* per gallon. Among the prices of some of the principal Rhine wines, quoted by Dr. Henderson, are some reaching the amount of 38*s.*, and upwards of 2*l.* per gallon; there are some even running as high as 18*s.* the bottle.

Dr. Henderson observes, that the same causes which have led to the degeneracy of some of the most celebrated French wines, have operated equally on those of the Rhine. The health of the vine, and

[*] The *graves* are wines grown upon the gravelly lands to the south-east and south-west of Bordeaux; they are so called from the nature of the soil.

the quality of its fruit, are liable to be affected by a variety of delicate circumstances; a single year of slovenly culture, an injudicious mode of pruning, or the substitution of new plants for old, may ruin the reputation of a vineyard for ever.

For a long time the choicest growths, not only in France but in other countries, were raised on lands belonging to the church; the *vinum theologicum* was justly held to be superior to all other wines. The rich chapters and monasteries were always more studious of the quality than of the quantity of their vintages; their grounds were tilled with the greatest care, and their vines were managed in the most judicious manner; nor did they reject a plant that bore but sparingly, provided there was no falling off in the goodness of the liquor which it supplied. Moreover, in the middle ages, it is well known that the clergy were almost the sole depositaries of learning; and the continued opportunities of observation and study which their retired pursuits afforded them, had probably brought them acquainted, at a very early period, with the best methods of directing the fermentation of the grape and meliorating the produce. When the domains passed into the hands of laymen, the same assiduity and skill were seldom shown in the culture of the vines, or treatment of the vintage; and, in many instances, the old plants, which yielded the most valued wines, were rooted out to make room for others that gave a more abundant supply, but of inferior character.

There is, however, another circumstance to be urged in explanation of the fact, that the choicest wines, in the middle ages, were raised on lands belonging to the church.

The monks (observes a writer in the *Quarterly Review*,) were not only, as depositaries of all the learning of the times, themselves most skilled in the culture of the vine, and the manufacture of its juice; but they were also, in every respect, the best landlords, and maintained the happiest dependants. Respect for the church generally saved their land from devastation in feudal broils; there was more security in their cultivation, and they would naturally communicate some of the results of study and experience in rural economy to their vassals.

At no time, however, can the cultivation of the vine on the banks of the Rhine have been attended with much gain and happiness to the labourer. It is true that some countries support a numerous population, but the poverty and misery of the peasantry in them has been long proverbial. Nearly half a century ago, Dr. Cogan spoke of the axiom, "that poverty is most prevalent where the vine is most cultivated," as being well founded. He said that numerous vineyards, such as those on the banks of the Rhine, notwithstanding the picturesque scenes which they presented to the eye, or "the pleasant ideas of luxurious conviviality" which they excited, were, by no means the primary blessings of a country.

Bacchus, whatever, joviality he may occasion, has not the benevolence of Ceres; although, by exhilarating the spirits, he may for a season conceal the distress he occasions. Wine is a luxury which cannot furnish either food or raiment to the peasant, and the real necessaries of life are always the dearest where this superfluity becomes the chief article of attention and of commerce; they are purchased as *foreign* commodities, and consequently at an advanced price.

It is not the business of virtue to extirpate the affections of the mind, but to regulate them. It may moderate and restrain, but was not designed to banish gladness from the heart of man. Religion contracts the circle of our pleasures, but leaves it wide enough for her votaries to expatiate in. The contemplation of the Divine Being, and the exercise of virtue, are in their own nature so far from excluding all gladness of heart, that they are perpetual sources of it. In a word, the true spirit of religion cheers as well as composes the soul: it banishes indeed all levity of behaviour, all vicious and dissolute mirth, but in exchange, fills the mind with a perpetual serenity, uninterrupted cheerfulness, and an habitual inclination to please others, as well as to be pleased in itself.—ADDISON.

THE WOOLLEN MANUFACTURE.
No. III.

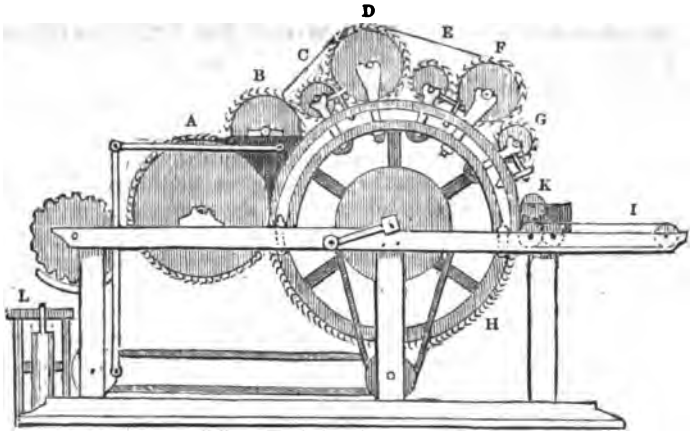
THE MANUFACTURE OF SHORT OR CLOTH WOOL.

THE first operation to which the short wool is subjected when received by the manufacturer, is that of opening or disentangling its fibres; for this purpose a machine called a *wool-mill*, *willy*, or *willow*, is employed. It may be described as a cylindrical or conical drum, about three feet long, and two and a half in diameter, thickly covered with sharp pointed teeth, or spikes. This cylinder works upon a strong axis, and is enclosed in a wooden frame or box, two ends of which can be opened, being fixed on *hinges*; the bottom of the box is not solid, but formed of slips of wood with intervals between them, to allow any dust which may be disengaged in the process to fall through. Over the cylinder, its axis being horizontal, are five smaller rollers or cylinders, also furnished with teeth, and turning on their own axes. The teeth of the rollers and those of the drum, *intersect* each other during the rotation, as do also the teeth of the rollers themselves. The front door being turned down on its hinges, a quantity of raw wool is laid on it; the door is then closed, and the wool by that means brought within reach of the teeth of the large drum, which carries it upwards so as to work it between its own teeth and those of the smaller cylinders; as the motion is very rapid, the fibres of wool are separated and pulled about in all directions. After being submitted for a certain time to these operations, the door on the other side of the case that encloses the drum is opened, and the wool thrown out by the centrifugal force of the cylinder. The front door is then opened, a fresh supply of wool is introduced and again thrown out, and so on. This process is repeated several times according to the nature of the wool, or the purpose for which it is designed; if the wool is dyed, it undergoes the same operation after the dying.

The *scribbling machine* is next employed; this, in principle and construction resembles the last, but instead of the cylinders being covered with strong teeth like spikes, their surfaces are furnished with *cards* like those used in the manufacture of cotton*; by means of this machine the fibres of the wool are more equally distributed, and the wool passes through this machine three times. It now is removed to the *carding-engine*.

The carding-engine consists of a number of smaller cylinders, A B C D E F G, covered with *card-cloth*, revolving round a larger cylinder H, covered in the same manner. The large cylinder is about thirty-six inches in diameter, and thirty-two inches in length. I is an endless apron on which the wool is spread equally by hand; this apron is carried slowly onwards towards the two feeding-rollers K, by which it is seized and conveyed to the small cylinder G; from this it is transferred to the large cylinder H. The three largest of the first six small cylinders are called *workers*, and the three smaller, *cleaners*; the wool, in the first instance applied to the large cylinder or drum, is taken off by the first worker, which is in its turn rubbed by the first cleaner, this last returns it to the drum; it is taken up again by the second worker, and again removed by the second cleaner, and so on, until it reaches the cylinder A, called the stripping-cylinder or *doffer*, which is much larger and turns slowly. The cards on the doffer do not entirely cover its surface, but are placed on in stripes, fig. 2. The wool falls off the doffer in fleeces about four inches in breadth, and twenty-seven or twenty-eight in length,

* See *Saturday Magazine*, Vol. V., p. 100.



THE WOOL-CARDING ENGINE.

Fig. 2

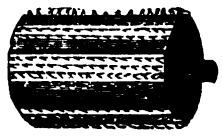
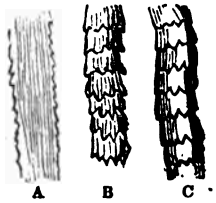


Fig. 3.



and is received in a cylindrical box L, in the centre of which a fluted cylinder revolves, which gives the fleeces a spiral form, the first element of the thread.

The next operation is performed by the *slubbing-billy*. It reduces the cardings by drawing them out in lengths, joins them in a continuous spongy cord, giving them at the same time a slight twist to prevent their breaking. The wool is now in the state of a soft thread, similar to a *roving* in the cotton manufacture, and is called a *slubbing*; it is now ready to be spun into a thread of a harder texture. The operation of slubbing and spinning in worsted so nearly agree with the same processes in the cotton manufacture, that it would be unnecessary again to enter upon the subject.

When the cloth first comes from the weaver, it is in a very rough unsightly state, and contains a quantity of oil, with which it has become combined during the several processes it has undergone. The next operation is *scouring*, which is performed in the fulling-mill, the cloth being soaked in an alkaline ley, and beaten by machinery; it is then well rinced with pure water and hung on the tenter-frames to dry. When dry, it is taken down and examined carefully, the knots picked out, and any rents or cuts it may have received, repaired by introducing fresh threads; this is called *burling*. The cloth has now to be thoroughly cleaned in the *fulling-mill*, by means of soap and water

The next process is *milling*, or *felting*. In the state in which the cloth is received from the *tenter-field*, the naked threads are very perceptible, and the operation of milling is to swell the threads, and *felt* them so as to allow of the cloth afterwards receiving that fine smooth and polished surface, which is the great beauty of fine cloth, and which renders it also more impervious to wet. Commonly, a piece of cloth of sixty-two yards, requires six pounds of soap, which is dissolved in water, and about a handful spread upon each yard in length; the piece is then put into a trough and worked for three hours in the fulling-mill. After twelve hours milling, the cloth is reduced in breadth about two-fifths, and in length one-third; it is now again strained on the tenter-frame, by which it is stretched about one-twentieth, or two yards in forty, but it is very little extended in breadth. The property of felting is only possessed by the short wool, and it is of so singular a nature, that it deserves particular notice.

If an ear of bearded corn is introduced between the wristband and the wrist, the stalk being placed towards the shoulder, the common motions of the arm will cause the ear of corn to move upwards until it reaches the shoulder, and this occurs whether the arm is thrust out of the sleeve or drawn back; this motion takes place by means of the jagged ends of the grains of corn. The thrusting of the arm outwards would naturally tend to thrust forwards the ear, but the sharp angles of the grain fixing themselves firmly into the shirt-sleeve, maintain the ear in its situation; if the arm is drawn in, the same cause enables the ear to catch hold of the skin and to be drawn upwards, and this is repeated every time the arm is drawn inwards or forced outwards.

Now the construction of the hair of the sheep and the ear of corn is somewhat similar, and the magnified view of three kinds of wool, fig. 3, will show the reason why one sort will felt and the other will not. The long English wool A, it will be seen, is much less notched on its surface than the Saxon B, or the original Spanish C, and therefore resembles less the ear of corn, and will not be acted on in the same manner. The fibres of the cloth made of short wool on being subjected to the operation of fulling, shrink considerably in their length, and close in, as it were, upon each other. The jagged ends of this wool now become entangled, and any attempt to stretch the cloth again to its original length and width would be useless; the more frequently this operation of fulling is repeated, the thicker the texture of the cloth becomes, and it is then said to be *double milled*. We know that if common woollen cloth, when made up into a garment, should get wet, it shrinks considerably, much to the annoyance of the wearer, who, in this manner, has it milled upon his own person. The felting of wool in the manufacture of hat bodies, is effected by acting on the same principles, but the process is more frequently repeated, so as to cause the fibres of the wool to be completely matted together.

After the milled cloth has been properly dried, it has to be *dressed*; this was formerly done by means of the seed-vessels of the fuller's teasle, formed into a kind of hand card, but latterly it has been effected by machinery, and in some cases by means of very fine wire cards. The dressing is the process by which the nap is raised.

The last operation the cloth has to undergo is called *shearing*, or *cropping*; the wool, by the operation of dressing, covers the surface of the cloth like loose fur, which must be removed before it is fit for the market; this was formerly effected by hand with a large pair of shears, but of late years this part of the manufacture has also been performed by the aid of machinery. The cutting instruments resemble the blades of the hand shears, one blade is fixed in an oblique direction, while a revolving cylinder is furnished with several moving blades, which act in succession against the fixed blade, in the same manner as if a pair of shears were worked by hand. The cloth itself is stretched over a metal bed to prevent its lying in creases. The list being thicker than the

rest of the fabric is left unsheared, the blades of the cutters not being of a sufficient width to cut the nap with which it is covered, and as the list is thicker than any other parts of the cloth, grooves are contrived for its reception, and to allow the shears to clip close.

Some of the common woollen cloths are hot-pressed to give them a face, and as this smoothness should only appear on one side, the other is made rough again by means of a sponge and water; this kind of cloth is also dyed after weaving, and the list is sewn on to give it the appearance of having been dyed *ingrain*.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT. No. IV.

EFFECTS OF THE EXPOSURE OF THE EYE TO ACRID FUMES.

(4.) We need not offer more than one illustration to this class, inasmuch as others will be readily suggested to the reader's own mind when we state that many fumes, vapours, gases, such as those afforded by ammonia, muriatic acid, &c., so affect the sentient apparatus of the eye as to cause a general irritability which the eye itself tends to remove by exciting a flow of tears. This power, however, is lost in time: inflammation comes as a prelude to disease of a permanent and more lasting character.

The case we have selected is a remarkable one, illustrating the noxious effects resulting from exposure of the person to acrid fumes. A class of persons employed in cleansing the immense sewers of the city of Paris are subject to a disease which is called in one case *la mitte*, in the other case *le plomb*. The former is caused by ammoniacal vapours, and is announced by a smarting in the eyes, and the eye-ball and pupil soon become red, accompanied with other pains, chiefly about the head. Blindness often results, which lasts for a day or two. The patients endure much pain, and get no relief until tears begin to flow. In slight attacks exposure to the open air and shading the eyes is a sufficient remedy: if the attack is strong the men are accustomed to wash their eyes in cold water, to tie a wet bandage over them, and to remain in the dark.

Le plomb is also due to gaseous exhalations, chiefly sulphuretted hydrogen and ammoniacal gases, producing convulsions and other alarming symptoms. The danger to these workmen is now entirely removed by the copious use of chlorine in combination with lime or soda, as chlorine possesses the valuable property of entirely destroying and neutralizing these effluvia.

It is perhaps in this place that we may mention a train of effects resulting from narcotics taken inwardly. The effects produced do not certainly come under the denomination of fumes as ordinarily considered; but, be that as it may, the subject is one of much importance, and we do not wish to pass it over unnoticed.

Amaurosis is caused by the use of narcotic substances which have been supposed to act specifically in depressing the energy of the nervous system in general. The symptoms of amaurosis, however, by no means support the opinion that they have a direct sedative operation: the loss of sensibility, as well as the dilatation of the pupil, may be the effect of increased excitement, or a full state of the vessels; for besides considerable external turgescence, sensibility of the pupil almost invariably returns on having recourse to bleeding. The principal substances of this class are *opium* in large doses, *hyosciamus*, *stramonium*, and *bella donna*. The well-known effect which these substances possess of dilating the pupil when applied to the surface of the eye, or of the neighbouring parts, differs only in degree from what follows their being taken into the stomach; but instead of effecting a loss of power or paralysis of the iris, they seem rather to act as stimuli on the antagonist fibres which compose the greater ring of the iris, and thus overcome its normal or regular obedience to the stimulus of light, analogous to those involuntary and spasmodic actions which they occasion when taken internally. See Vetch on *Diseases of the Eye*. Christison also in his *Treatise on Poisons*, cites numerous interesting cases of the effect of narcotic poisons on the pupil of the eye.

LAVA. MOUNT VESUVIUS.

It was in the month of February (1793) that I went with a party to the source of the lava, for the first time, to ascertain the real state in which the lava proceeded from the volcano that created it. I found the crater in a very active state, throwing out vollies of immense stones, transparent with vitrification, and such showers of ashes involved in thick sulphurous clouds, as rendered any approach to it extremely dangerous. We ascended as near as possible, and then, crossing over to the lava, attempted to coast it up to its source. This we soon found was impossible, for an unfortunate wind blew all the smoke of the lava hot upon us, attended at the same time with such a thick mist of minute ashes from the crater, and such fumes of sulphur, that we were in danger of being suffocated. In this perplexity I proposed immediately crossing the current of liquid lava, to gain the windward side of it, but felt some fears, owing to the very liquid appearance the lava there had so near its source. All my companions were against the scheme, and while we stood deliberating, immense fragments of stone and huge volcanic bombs, that had been cast out by the crater, but which the smoke had prevented us from observing, fell thick about us, and rolled by us with a velocity that would have crushed any of us, had we been in their way. I found we must either leave our present spot, or expect instant death: therefore, covering my face with my hat, I rushed upon the lava, and crossed over safely to the other side, having my boots only a little burnt, and my hands scorched. Not one of my companions, however, would stir; nor could any persuasion of mine avail in getting a single guide over to me. I then saw clearly the whole of the scene, and expected my friends would every moment be sacrificed to their own imprudence and want of courage, as the stones from the crater fell continually around them, and vast rocks of lava bounded by them with great force. At last I had the satisfaction of seeing them retire, leaving me entirely alone. I begged hard for a torch to be thrown over to me, that I might not be lost when the night should come on. It was then that André, one of the cicerones of Resina, afer being promised a bribe, ran over to me, and brought with him a bottle of wine and a torch. We had coasted the lava ascending for some time, when looking back I perceived my companions endeavoring to cross the lava lower down, where the stream was narrower. In doing this they found themselves insulated, as it were, and surrounded by two different rivers of liquid fire. They immediately pressed forward, being terribly scorched by the combined heat of both the currents, and ran to the side where I was; in doing which one of the guides fell into the middle of the

red-hot lava, but met with no other injury than having his hands and face burnt, and losing at the same time a bottle of *vin de grave*, which was broken by the fall, and which proved a very unpleasant loss to us, being ready to faint with excessive thirst, fatigue, and heat. Having once more rallied my forces, I proceeded on, and in about half an hour I gained the chasm through which the lava had opened itself a passage out of the mountain. To describe this sight is utterly beyond all human ability. My companions shared in the astonishment it produced; and the sensations they felt, in concert with me, were such as can be obliterated only with our lives. All I had before seen of volcanic phenomena did not lead me to expect such a spectacle as I then beheld. I had seen the vast rivers of lava that descended into the plains below, and carried ruin and devastation with them; but they resembled a vast heap of cinders, or the *scoriæ* of an iron-foundry, rolling slowly along, and falling with a rattling noise over one another. Here a vast arched chasm presented itself in the side of the mountain, from which rushed, with the velocity of a flood, the clear vivid torrent of lava in perfect fusion, and totally unconnected with any other matter that was not in a state of complete solution, unattended by any *scoriæ* upon its surface, or gross materials of an insolvent nature, but flowing with the translucency of honey, in regular channels, cut finer than art can imitate, and glowing with all the splendour of the sun.

The eruption from the crater increased with so much violence that we proceeded to make our experiments and observations as speedily as possible. A little above the source of the lava I found a chimney of about four feet in height, from which proceeded smoke, and sometimes stones. I approached and gathered some pure sulphur, which had formed itself upon the edges of the mouth of this chimney, the smell of which was so powerful, that I was forced to hold my breath all the while I remained there. I seized an opportunity to gain a momentary view down this aperture, and perceived nothing but the glare of the red-hot lava that passed beneath it. We then returned to examine the lava at its source. Sir W. Hamilton had conceived that no stones thrown upon a current of lava would make any impression. We were soon convinced of the contrary. Light bodies of five, ten, and fifteen pounds' weight made little or no impression, even at the source; but bodies of sixty, seventy, and eighty pounds, were seen to form a kind of bed upon the surface of the lava, and float away with it. A stone of three hundred weight, that had been thrown out by the crater, and laid near the source of the current of lava, I raised upon one end, and then let it fall upon the liquid lava, when it gradually sunk beneath the surface, and disappeared. If I wished to describe the manner in which it acted upon the lava, it was like a loaf of bread thrown into a bowl of very thick honey, which gradually involves itself in the heavy liquid that surrounds it, and then slowly sinks to the bottom. The lava itself had a glutinous appearance; and although it resisted the most violent impression, seemed as if it might easily be stirred with a common walking-stick. A small distance from its source, as it flows on, it acquires a darker tint upon its surface, is less easily acted upon, and, as the stream gets wider, the surface having lost its state of perfect solution, grows harder and harder, and cracks into innumerable fragments of very porous matter, to which they give the name of *scoriæ*, and the appearance of which has led many to suppose that it proceeded thus from the mountain itself, being composed of materials less soluble than the rest of the lava, lighter, and of course liable to float continually on the surface. There is, however, no truth in this. All lava at its first exit from its native volcano flows out in a liquid state, and all equally in fusion. The appearance of the *scoriæ* is to be attributed only to the action of the external air, and not to any difference in the materials that compose it, since any lava whatever, separated from its channel, at its very source, and exposed to the action of the external air, immediately cracks, becomes porous, and alters its form. As we proceeded downwards this became more and more evident, and the same lava which at its original source flowed in perfect solution, undivided, and free from loose encumbrances of any kind, a little farther down had its surface loaded with *scoriæ*, in such a manner, that upon its arrival at the bottom of the mountain, the whole current resembled nothing so much as a rolling heap of unconnected cinders from an iron-foundry.

The fury of the crater continuing to increase, menaced us with destruction if we remained any longer in its neighbourhood. A large stone, thrown out to a prodigious height, hung for some time over our heads in the air. Every one gave himself up for lost, until it fell harmless beyond us, shattering itself into a thousand fragments, which rolled into the valley below. We had not left this spot above five minutes before a shower of stones, issuing from the crater, fell thick upon it, covering the source of the lava, and all the parts about it; so that had we waited, as I begged to do, a little longer, every one of us would have been crushed to atoms.

During my second visit the appearances were pretty much the same. I though the lava flowed slower, and was less in fusion than before, the surface appearing tougher, and being sooner converted into *scoriæ*. We dressed our beef-steak upon the lava, no fire being better calculated for that purpose, owing to the excessive heat it gives.

Upon my third visit I found the lava had taken a different course, and flowed towards the Torre del Annonciato, whereas it had before proceeded in a channel exactly opposite the cross. The source itself had undergone great alterations, and bore strongly the marks of an earthquake.——Bishop Otter's *Life of Clarke*.

There is inconsistency and something of the child's propensities still in mankind. A piece of mechanism, as a watch, a barometer, or a dial, will fix his attention. A man will make journeys to see an engine stamp a coin or turn a block; yet the organs through which he has a thousand sources of enjoyment, and which are in themselves more exquisite in design, and more curious both in contrivance and in mechanism, do not enter his thoughts; and if he admire a living action, that admiration will probably be more excited by what is uncommon and monstrous, than by what is natural and perfectly adjusted to its office,— by the elephant's trunk than by the human hand. This does not arise from an unwillingness to contemplate the superiority or dignity of our own nature, nor from an incapacity of admiring the adaptation of parts. It is the effect of habit. The human hand is so beautifully formed, it has so fine a sensibility, that sensibility governs its motions so correctly, every effort of the will is answered so instantly, as if the hand itself were the seat of that will. Its actions are so powerful, so free, and yet so delicate, that it seems to possess a quality of instinct in itself, and there is no thought of its complexity as an instrument, or of the relations which make it subservient to the mind: we use it as we draw our breath, unconsciously, and have lost all recollection of the feeble and ill-directed efforts of its first exercise by which it has been perfected. Is it not then the very perfection of the instrument which makes us insensible to its use?——Bell.

THE CICADA, AND ITS ORGANS OF VOICE.

THE Cicadæ are insects belonging to the order called *Hemiptera*, (half-winged,) on account of the wings partaking generally of a double character, being partly of a leathery substance and partly transparent; in the Cicadæ, however, this distinction is not so apparent. The Cicadæ are found in abundance in most of the warmer parts of the globe; there are also several species, natives of more temperate regions. These insects are noted for the singular noise they produce, and on this account they were in great favour among the ancient Greeks. They were kept in cages for the sake of their song, and were a favourite image of innocence and cheerfulness with the poets of Greece. One bard intreats the shepherds to spare the innoxious *Tettix*, (the Greek name for the Cicada,) that nightingale of the Nymphs, and to make those mischievous birds, the thrush and blackbird, their prey.

Sweet prophet of the Summer, (says Anacreon, addressing this insect,) the Muses love thee; Phœbus himself loves thee, and has given thee a shrill song; old age does not wear thee out; thou art wise, earthborn, musical, impassive, without blood.

The sound produced by the Grecian Cicada must necessarily have been musical; it was called by the same name as the music of the harp.

A Cicada, sitting upon a harp, was a usual emblem of the science of music, which was thus accounted for:—When two rival musicians, Eunomus and Ariston, were contending upon that instrument, a Cicada, flying to the former, and sitting on his harp, supplied the place of a broken string, and so secured him the victory.

The Cicadæ of modern times are equally famous for the power, if not for the musical property of their voice. Dr. Shaw, in his Travels, says,—

In the hotter months of Summer, especially from midday to the middle of the afternoon, the Cicada is perpetually stunning our ears with its most excessively shrill and ungrateful noise. It is, in this respect, the most troublesome and impertinent of insects, perching upon a twig, and squalling sometimes two or three hours without ceasing, thereby too often disturbing the studies or short repose, which is frequently indulged in in these hot climates for a few hours.

The Brazilian Cicadæ are said to sing so loud, that they can be heard at the distance of a mile. On account of the sound this insect produces, it is called in the United States, the American Locust.

The apparatus by which the male Cicada produces the sound for which it is famous, is thus described in Kirby and Spence's beautiful work on Entomology.

If you look at the underside of the body of a male, the first thing that will strike you is a pair of large plates, of an irregular form, B; in some semi-oval, in others triangular, in others again a segment of a circle of greater or less diameter, covering the anterior part of the belly; these are the drum-covers, or opercula, from beneath which the sound issues, at the back of the posterior legs. Just above each operculum there is a small pointed triangular process, (*persillum*,) A, the object of which, as Réaumur supposes, is to prevent them from being too much elevated. When an operculum is removed, beneath it you will find, on the exterior side, a hollow cavity, with a mouth somewhat linear, (like a slit, the width of a line,) fig. 2, A, which seems to open into the interior of the abdomen. Next to this, on the inner side, is another large cavity, B, of an irregular shape, the bottom of which is divided into three portions: of these the posterior is lined obliquely with a beautiful membrane, which is very tense, C; in some species semi-opaque, and in others transparent, and reflects all the colours of the rainbow; this mirror is not the real organ of sound, but is supposed to modulate it. The middle portion is occupied by a plate, of a horny substance, placed horizontally, and forming the bottom of the cavity B. On its inner side this plate terminates in a crania, or elevated ridge, common to both drums. Between the plate and the after-breach, (*post pectus*,) another membrane, folded transversely, fills an oblique, oblong, or semilunar cavity. In some species I have seen this membrane in tension, probably the insect can stretch or relax it at pleasure, but even all this apparatus is insufficient to produce the sound of these animals. One, still more important and curious, still remains still to be described. This organ can only be discovered by dissection. A portion of the first and second segments being removed from that side of the back of the abdomen which answers to the drums, two bundles of muscles, fig. 3, B, meeting each other in an acute angle, attached to a place opposite to the point of the *mucro* (a pointed prominence, like a sharp tooth,) of the first ventral segment of the abdomen will appear. These bundles consist of a prodigious number of muscular fibres, applied to each other, but easily separable. Whilst Réaumur was examining one of these, pulling it from its place with a pin, he let it go again, and immediately, though the animal had been long dead, the usual sound was emitted.

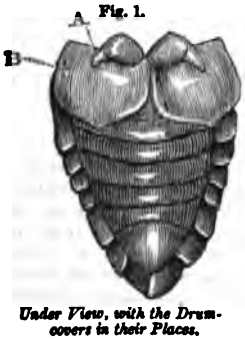


Fig. 1.

Under View, with the Drum-covers in their Places.

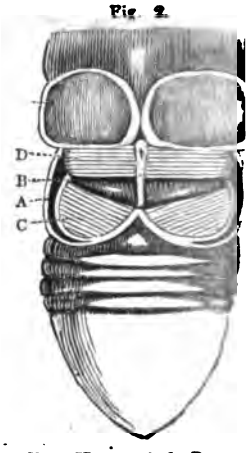


Fig. 2.

Under View, with the Drum-covers turned back.

If these creatures are unable themselves to modulate their sounds, here are parts enough to do it for them, for the mirrors, the membranes, and the central portions with their the cavities, all assist in it. If you remove the lateral part of the first dorsal segment of the abdomen, you will discover a semi-opaque, and nearly semicircular concave-convex membrane, with transverse folds, fig. 3, A; this is the drum. Each bundle of muscles before mentioned, is terminated by a tendinous plate, nearly circular, from which issue several little tendons that, forming a thread, pass through an aperture in the horny piece that support the drum, and are attached to its under or concave surface. Thus the bundle of muscles, being alternately and briskly relaxed and contracted, will by its play, draw in and let out the drum, so that its convex surface being thus rendered concave when pulled in, when let out, a sound will be produced by the effort to recover its convexity, which sound striking upon the mirror and the other membrane before it escapes from under the operculum, will be modulated and augmented by them. I should imagine that the muscular fibres are extended and contracted by the alternate approach and recession of the trunk and the abdomen to and from each other.

Fig. 3

Back View; several Portions of the Skin removed to show the Drum and its Muscles.

THE CICADA.

The Drum of the Cicada, and the Muscles by which it is moved.

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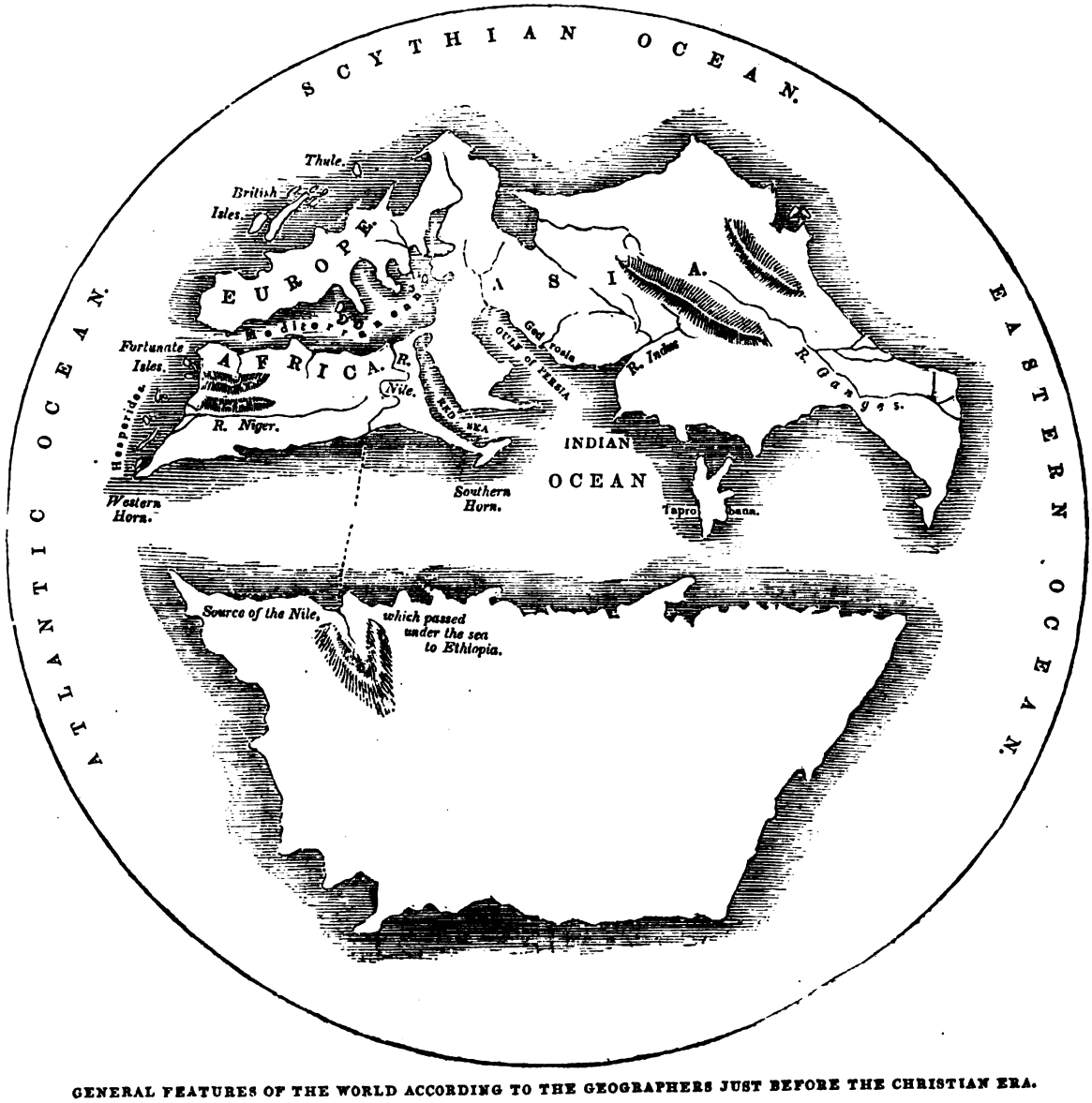
A BRIEF HISTORY OF NAVIGATION.



GENERAL FEATURES OF THE WORLD ACCORDING TO THE GEOGRAPHERS JUST BEFORE THE CHRISTIAN ERA.

PART II.

CAUSES OF THE ROMANCE OF ANCIENT NAVAL HISTORY.

WE have already observed that the scene of the earliest known navigation was the Mediterranean Sea, which naturally seemed to the ancients to be situated *in the middle of the earth*; as is implied by its name. As navigation advanced only at a creeping pace, and as but a small amount of fresh experience was laid up by one generation for the benefit of the next, it took very many ages to explore the Mediterranean, Tyrrhene, Hadriatic, and Ægean seas. The people of Tyre and Sidon, the Phœnicians, "whose merchants were princes," (Isaiah xxiii. 8.) were among the first whom the spirit of commerce and the desire of gain had made dissatisfied with what had hitherto seemed the natural limits of marine excursion. The great antiquity of the Phœnicians, however, is perhaps the reason why our knowledge of them is obtained from incidental and isolated accounts: but on the naval spirit and industry of Carthage, a colony planted by the former power, in the ninth century before Christ, the light of history, owing to their connexion with the Romans, is more abundantly shed. With the Carthaginians, perhaps, had originated the idea of quitting the Mediterranean by the straits of Gades, (now Gibraltar,) of sailing southward, circumnavigating the coast of Africa, and then returning northward by the Red Sea, towards the Levant, or eastern side of the Mediterranean. This notion seems to have been cherished for ages, as the prime, the crowning enterprise, long thought of and debated; but which only a solitary few, at long intervals of time determined to try

to effect. Knowing only a portion of the globe, and conceiving that portion to be upon an extended plane, those who held a voyage from Crete to Egypt to be a signal proof of naval courage, and who had never reached Sicily or Africa, but by a wayward tempest, or by shipwreck, and who were then objects of wonder at having escaped the dangers of Scylla and Charybdis, and the Syrtes, those wave-bound prisons of mariners, might justly have feared for themselves, in being committed to unknown waters, and in tracking shores, which the reports of others, who had never seen these regions, no less than their own fears, had represented as the abode of every horror. In short, distance from the land seems to have alarmed all the ancients; who, upon every occasion, when quitting sight of the shore fancied they saw, as Homer tells us,—

A length of ocean and unbounded sky,
Which scarce the sea-fowl in a year o'erfly.

The general truth of these observations is corroborated by the story of the Pamphylian, who was taken prisoner, and carried to Egypt. He was kept as a slave, for a very long time, at a town near one of the mouths of the Nile, where Damietta now stands. Being frequently employed to assist in maritime business, he conceived the idea of committing himself to the mercy of the waves in a sailing boat, in order that he might once again behold his native country. Having provided himself, to the best of his means and ability, he set sail, resolving rather to perish in the bosom of the old ocean than to remain longer in captivity. He traversed the vast expanse of waters which lies between Egypt and Asia Minor, and arrived safely at Pamphylia. From this bold and unusual adventure he lost his original name, and received the appellation of *Mononautes*, or *the lone sailor*, which, for a long time after, we may presume, served his family as a patent of nobility. We have the foregoing account from Eustathius, the commentator of Homer.

Navigation has served to bring the families of the earth nearer together, to remove ignorance and barren limitation of thought; and consequently, it has been a means for advancing the landmarks of knowledge and civilization, and for helping man to appreciate the acts of a Divine Providence. But, as it is entirely consonant with humanity that the increase of knowledge should carry with it its alloy of evil, we find that the means for spreading knowledge, served also as a vehicle for the diffusion of falsehood. The accounts, therefore, that have been handed down to us of the exploits of early navigators must be received without prejudice either way, and their errors and their romances must be imputed to the right source. This source seems to be of a twofold nature; firstly, misapprehension in making their observations and statements, arising from ignorance and want of experience, which engender fear: secondly, the love of lucre is so strongly implanted in the human mind, that this affection is oftentimes too apt to get the better of all other feelings, whether good or ill. Hence, in the growing spirit of trade and commerce, the monopoly long enjoyed by the Phœnicians, and subsequently by other commercial nations, was protected by the publication of appalling accounts of the dangers, distresses, and horrors, which they underwent; the dread of which, they hoped, would deter the sailors of other regions from disputing with them a claim to the wealth of the earth. In looking back, therefore, through the vista of time, to the early condition of this world, and in studying the accounts thereof, as handed down from the heathen authors, who are our chief guides, we must separate the probable from the improbable, and the true from the false, and revolve in our minds the progressive condition of mankind, as illustrating the moral government of the Almighty.

VOYAGES RELATED IN ANCIENT HISTORY—FEARS OF THE ANCIENT MARINERS.

The general correctness of the foregoing observations may be estimated by an epitome, in the way of illustration, of the principal ancient voyages, with which history makes us acquainted. We may remark, in the highly coloured memoirs of the times, that many things which were false were credited then, and still later; whereas, other things, which have been subsequently recognised as perfectly true, seemed at that time so startling to the conceptions of mankind, that no credence was awarded to them. The accounts of the first and third voyages, which follow, are mainly derived from the rhapsodies of the poets.

1. In the thirteenth century B. C., Jason, accompanied by a Phœnician pilot, sailed in the ship Argo, over the Euxine, which we now call the Black Sea, to recover the treasure which had been carried away by Phryxus, in the ship Aries, or Ram. The Phœnician word for *treasure*, is almost the same as the Greek word for *fleece*. Hence, the confusion of ideas, by which the poets profited to adorn their legends, for Jason was reported to have made a voyage to recover the ram with the golden fleece. Those who manned Jason's ship, were called *Argonauts*, or *sailors of the Argo*; and, at their return, declared that their passage had been alongside of the abodes of the just and the prisons of the infernal regions.

Some endeavour to clear up the account of this voyage, by relating that the inhabitants on the eastern side of the Euxine Sea were in the habit of extending fleeces of wool, to catch the golden particles which were washed down from Mount Caucasus.

2. It is believed by some commentators on the Bible, that Solomon, who lived about a thousand years before the Christian era, sent large fleets down the Red Sea, and so eastward to India; or towards the south-west, along the African coast. These ships were managed by Tyrian mariners who were the most expert of the day; yet, for want of the mariner's compass*, their navigation was performed by coasting along the shores; so that a voyage to India is said to have frequently taken up three years, as we read in the Sacred Record. Prideaux thinks that the succeeding kings of Judah carried on the same commerce; which was at length lost, when Elath, their port on the Red Sea, was taken from King Ahaz by Rezin, King of Damascus. (2 Kings xvi. 6.) It would seem as if this intercourse with India was stopped for several centuries after the times we have just spoken of.

3. The following mythological narration may, by a little calm analysis, be found to consist of some degree of truth. Neptune is reported to have delivered the princess Hesione from a monster, raised by some divine interposition out of the sea, and to which she was exposed by express command of the oracle. It is probable that this Neptune was Rameses, who, being a chief of restless disposition, quitted Egypt, his native country, incited either by a thirst of effecting some territorial discovery, or a lust of acquiring by conquest the dominion of some foreign country. Chance or inclination conducted him and his followers to that spot, where their bravery as warriors, and their skill in passing through a country by means deemed preternatural by all not acquainted with them, made them to be honoured and feared, as beings of a superior order. The marine monster we may fairly interpret to have been a vessel, conveying to the same spot some unknown adventurers equally bold, but who, being less powerful, or less fortunate, fell easily before the Egyptians.

4. Necho, King of Egypt, in the year 610 B.C., endeavoured to solve the grand nautical problem of Africa. He employed Phœnician navigators to set sail from the Red Sea, which lay at the east of his dominions, and to explore towards the south. We are told that they spent three years in the voyage; and, as the ships of the ancients did not admit much room for stowing away provisions, they debarked at times on the coast, sowed grain, waited its ripening, reaped, prepared food, and again set sail. This they did in each year, being favoured with the maturing beams of a tropical sun. At length, to their great joy and astonishment, they reached the Straits of Gibraltar, passed between the pillars of Hercules, two rocks being the nearest and opposite points of the continents of Europe and Africa, and at length arrived safely at the shores of Egypt.

In the publication of this memorable voyage, the world was astonished at being informed, that the sun, while the Phœnicians were passing round the southern part of Africa, was at their right hand; or, in other words, that it described its course from East to West, in the northern heavens; or, speaking still more simply, that it appeared at mid-day in the north, contrary to their former experience.

To an inhabitant of the equator, the sun will appear at noon, during one half of the year, in the north; during the rest of the year, in the South. At the southern promontory of Africa, or Cape of Good Hope, which is below the southern tropical line, the sun will always appear to attain its meridian in the north; and it is evident that the order of their voyage would keep the coast on their right hand continually.

We are given to understand that the relation of this voyage was almost universally discredited among the an-

* See *Saturday Magazine*, Vol. III., p. 116.

cients, for the very reason which should have moved them to belief; namely, the appearance of the Sun in the North at mid-day.

5. Darius, the son of Hystaspes, being the sovereign of the vast Persian Empire, was influenced by that insatiable ambition which has distinguished all conquerors. He planned an expedition to India, about 510 B. C., in order to conquer the country; but that he might not proceed without knowing something of the nature of the country he was about to attack, he fitted out a naval expedition, which he placed under the command of Scylax, the Caryandæan, giving him orders to sail down the river Indus, into the Southern Ocean; then to return by steering westward, and to make the best discoveries he could, as to the strength and riches of the countries on both sides of the river, as also on the sea-coast. Scylax, in pursuance of these instructions, passed down the Indus into the Indian Ocean, and returned by the straits of Babelmandel into the Red Sea, and landed on the Egyptian coast, near the neck of land which we now call the Isthmus of Suez. Scylax employed about thirty months in making this voyage; and gave a favourable report to Darius concerning the nature of the countries which he had seen. Accordingly, Darius fitted out a naval armament, which was to co-operate with his army, in the subjugation of the Indians; this attempt of Darius was successful; and opened the way for a more frequent intercourse between India and the nations bordering on the Mediterranean. The voyage of Scylax is believed to have been the first maritime expedition to India.

6. The next attempt to sail round the continent of Africa was that of Sataspes, a Persian nobleman, whom Xerxes had condemned to death, but whose sentence was commuted to the circumnavigation of Africa. He sailed from Egypt, in the year B. C. 480, through the straits of Gibraltar; and then southward. But, horror-struck at the mighty waves of the Atlantic, those walls of water, which dashed upon the shores of the desert,—after beating about for some months, he returned home, and suffered according to his original sentence.

The Persians were generally unacquainted with maritime affairs, and therefore never made any advance in the naval art, worth describing; this accounts for the want of perseverance on the part of Sataspes and his crew. The Athenians had made great improvements in their war-shipping, when the Persians attacked them during the reign of Xerxes. These improvements related chiefly to the formation of decks over the rowers, whereon the men of war carried on their operations without interfering with the rowers, and impeding the motions of the ship. This is believed to have contributed greatly to the success of the Athenians over the Persians, in their naval conflicts with that power.

7. In a collection of ancient voyages, published about one hundred and thirty years ago, there is a curious account of the discovery of an island, about five or six hundred years before Christ. There can be no doubt that this narrative is founded in truth; but that it is made more important than it really was by exaggeration, and a love of the marvellous. It is a translation from an ancient writer.

"There was one Jambulus, who from his youth was addicted to learning: his father was a merchant; and, after his decease, the son applied himself, with great diligence, to the same profession. This man, travelling into Arabia, in order to purchase spices, was there taken prisoner, with all his company, by a party of robbers. At first, he and one of his companions were employed in keeping sheep; but they were soon after carried off by the Ethiopians, inhabiting the coast, who conveyed them into their own country, in order to serve a very extraordinary purpose. These Ethiopians had a custom, which had then subsisted six hundred years, and was originally derived from the direction of an oracle, to expiate the sins of their nation once in an age, or generation, which with them comprehended the space of thirty years, by exposing two strangers, in the following manner:—

"They prepared a little vessel, well built, and extremely well equipped, with provisions for six months; on board of which the men were put, at a certain season of the year, with instructions to steer directly south, in order to arrive at a certain fortunate island, inhabited by a king and some hospitable people, with whom they might live happily all the rest of their days. The oracle declared, that if these men succeeded in their voyage, the country would enjoy rest and quiet for many years; but if, frighted by the dangers of the sea, they should return, it was ominous to Ethiopia; and therefore, they threatened Jambulus and his companion with the severest punishments, in case they did not prosecute their voyage. When the season of the year came, the Ethiopians celebrated the festival of Purgation with most splendid sacrifices; and then, having crowned each of them with garlands, they put Jambulus and his companion on board the vessel that had been prepared for them, and obliged them to put to sea.

"They were four months tossed by the winds and waves, before they arrived on the coast of the island to which they were bound; but at length they reached it safely. In its form it is almost round, being about five thousand stadia in compass; containing about five hundred of our miles, if we allow six hundred stadia to a degree. As soon as they came within sight of land, the people on the island crowded to the shore, to behold them: and, when they landed, multitudes came from all quarters to gaze at and admire them, wondering how they came thither; but treating them with the utmost kindness and civility, and offering them, with the greatest readiness, whatever their country afforded.

"These people differed not a little from other nations in their appearance, as well as in their manner; for they were all of a pretty equal size, each of them about four cubits, or six feet high. They bent and turned their bodies with such agility, that their bones seemed to our travellers as flexible as the sinews of other people: their bodies were very tender, notwithstanding which, they were so strong, that whatever they grasped could not be forced out of their hands. On their heads, eye-brows, eye-lids, and on their chins, they had hair; but the rest of their bodies was perfectly smooth. They were handsome and well-shaped; only the holes in their ears were much wider than those of other men, and had fleshy protuberances in them. Their tongues were very singular, being by nature somewhat divided, and cut in their infancy to the very root, so that they seemed double, which enabled them to imitate the notes, and even the chattering of birds; and, if our travellers say true, they could discourse with two people at once.

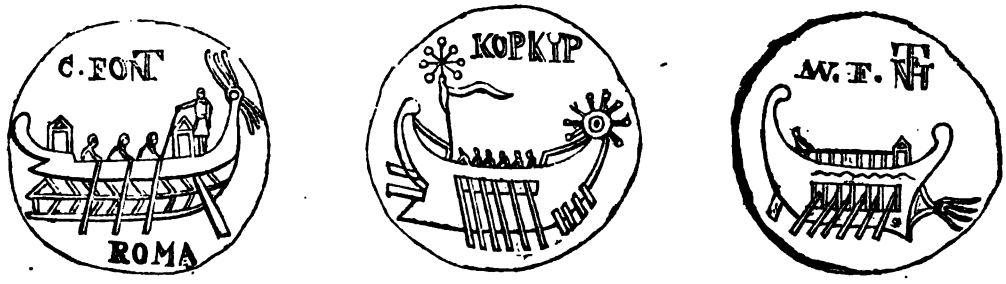
"This island is situated in a most excellent and moderate climate, lying very near the Equator, so that the people are neither scorched with heat nor perished with cold; enjoying at once, all the seasons, without any division, like ours, of Spring and Harvest. The days and nights there are always of equal length; neither is there any shadow at noon-day, because the sun is directly in the zenith. They are learned in all sorts of sciences, especially in Astrology. They use eight-and-twenty particular letters, for the expressing what they mean, composed of seven characters, each of which is varied four ways. They live long, without ever being sick, and commonly to one hundred and fifty years of age.

"After Jambulus and his companion had continued in this island seven years, they were compelled to depart, as persons of a vicious life, and not to be broken of foreign customs. Their ship, therefore, being again fitted out for them, and well furnished with provisions, they were constrained to put to sea; and, after continuing their voyage for above four months, they fell, at length, upon the sandy shallows of India, where his companion was drowned, and himself was afterwards cast ashore near a certain village, and carried away by the inhabitants of the place to the king, who was then at a city called Polybothra, or Polimbothra, many days' journey distant from the sea; where he was kindly received by that prince, who had a great love for the Grecians, and was studious in the liberal sciences. At length, having obtained provision from the king, he first sailed into Persia, and from thence safely arrived in Greece."

It has been supposed by most commentators on the above account, that the main incidents are true; but, as was before observed, they have had a tinge of the mavellous imparted to them. With respect to the island mentioned, some have supposed it to be Sumatra,—others Borneo,—others again Java,—while one writer has considered it to be one of the Maldive Islands.

8. About 500 years B. C. the Carthaginians fitted out two expeditions, for the sake of prosecuting discovery to the north and to the south, after clearing the Herculean straits. Hanno commanded one fleet, and proceeded southward, along the coast of Africa; and Himilco steered northward, along the Hiberian and Gallic shores.

Those under Hanno, steered round by Mount Atlas, the pillar of heaven, and doubled "the African Forehead," as its great western promontory was called. By day the land was too hot to walk upon, the country seemed to lie silent



REPRESENTATIONS OF WAR-GALLEYS ON ANCIENT ROMAN COINS.

and deserted, in the full unmitigated glare of a vertical sun, but by night the mountains seemed on fire, songs of rejoicing were heard, accompanied with the sounds of flutes, drums, cymbals, and gongs, together with cries, which waked the shrill echoes of night, and startled the senses of the Punic sailors. Scarcely different have been the records of modern travellers, respecting the inhabitants of these tropical wilds; who, fearing to be scorched by the solar ray, pass the day in caverns, or in sylvan shades, and wake up into lively existence under the milder beams of the moon and stars. Here they saw the various species of the monkey-tribe, pre-eminent among which is the ourang-outang,—original of Satyrs. The Thessalians had, before this, given rise to the fables of the Centaurs, by appearing to their neighbours on horses, which they had been the first to tame. In these places gold was found to be the universal metal; so common that the chains of captives were forged from it. The Carthaginians relate that the transactions which they had with the people of the African coast were carried on in dumb-show, that, a signal having been made with smoke, the savages placed the goods which they had to dispose of on the coast and retired, and that the Carthaginians, having removed these goods, deposited an equivalent. If that which the latter laid down, did not satisfy the former, it was not removed until a suitable addition had been made. This sort of barter is the primeval state of commerce. They were once astounded at the sight of sheets of flame, traversing the country and spreading in every direction down to the sea-shore; a conflagration made by the natives to get rid of the dry and waste grass at the end of autumn. Such were the causes of Africa being the reputed dwelling-place of the Gorgons, and other monstrous creations, springing from ignorant fear. Pliny tells us that this voyage was effected round the whole extent of the African continent.

Himilco, we are told, sailed as far as Britain and Ireland, the great Western Islands. It is generally, and with great reason, believed that the Phœnicians, and subsequently the Carthaginians, traded to the south-western coasts and islands of Britain for tin. Hence, Cornwall and the Scilly Isles were called by the ancients *Cassiterides*, or *Tin-countries*, a term derived from the Phœnician and Sanscrit.

9. Pytheas, an illustrious navigator of antiquity, who flourished in France, at Marseilles, a colony from Greece, about 400 years B.C., directed his course to the north-western parts of Europe. He reached Britain, then called Al-ffoun (Albion), or White-land, from the appearance of its cliffs at a distance. He kept on sailing, we are told, towards the north, and arrived at Thule. This is supposed to have been Iceland. Of this place, as also of the other islands and coasts of this sea, he relates that he found, in some parts, the light of the setting sun continuing so strong, till dawn of day, that the stars could not venture to appear; in others he found the sun shining by day and night. This account seems to have perplexed those who would otherwise have been inclined to credit him; but this fact, related by Pytheas, is quite natural during the middle of our summer, when approaching towards the Arctic circle. The converse of this, the polar winter, or the effects of it, felt less in proportion to the diminution of latitude, may apply to the account which we have of Ulysses, who, we read, sailed, *perhaps at the fall of the year*, to the ends of the ocean, where the Cimmerians dwell in profound gloom, who see neither the rising nor setting sun, but have the veil of night for ever spread over them. The credit of Pytheas was not much improved by his accounts of the four and six-horned sheep on the shores of the Baltic; but modern information attests the general accuracy of the Massilian sailor. Some part of his story wears, at first sight, a fabulous aspect; when we find from Tacitus, who retails it from him, that the noise of the sun in its passage below the ocean is heard; and that the figures of the gods appear visible, crowned with immortal light. By the latter observation we are to understand the varied effects of the Aurora Borealis; by the former the hollow noise of the rolling sea against the dreary shores of Norway. He intimates, that, in going very far to the north, sea, land, and air, seemed all confused; owing perhaps to fogs:—and that the water was of such a dense character, as could hardly be cleaved by the ship's prow; alluding, perhaps, to the strong tides of those seas. He is said to have been the first who ascribed the tides to the influence of the moon. The vulgar opinion, even up to the time of Mela, in the middle of the first century after Christ, was that the earth was a huge animal, the heaving of whose breast occasioned the rise and fall of the waters. Another opinion was, that the ocean had within itself vast caves, into which the water was regularly received, and out of which it was again as regularly ejected. Previously to quitting the Mediterranean, the tidal influence had not come under the consideration of man. This sea scarcely indicates any perception of that lunar attraction, which operates upon the waters of the earth generally. The probable reason is, that this sea, as also the Baltic, which admits of a parity of reasoning, is almost entirely cut off from the main oceans; and that the narrowness of the connecting straits does not allow the swell of the great waters to be felt within the requisite time of the moon's passing the meridian.

10. Before speaking of the naval exploits of Alexander the Great, of Macedon, we may mention that Curtius gives a circumstantial account of a fire-ship, which was equipped by the Tyrians, at the time their capital was besieged by Alexander. Having selected one of the largest galleys they possessed, they loaded it by the stern with stones and other ballast, so that the prow became considerably elevated above the surface of the water. The whole of the vessel, which was above water, was covered very thickly with sulphur and other inflammable substances; which operation being completed, advantage was taken of a wind favourable for the attempt, and all the sails being set, the crew, who, in aid of the sails, used their oars also, directed it towards the mole which Alexander had, with so much difficulty, laboured to construct. When they had approached sufficiently near to the destined object of destruction, the vessel was set on fire, and the crew jumped into boats, which had followed for the purpose of receiving them. This project completely succeeded, and Alexander was frustrated in his attempt on Tyre at that period. This place he ultimately subdued, and having no more land to conquer he sought the waters.

We now come to the voyage of Nearchus, the Macedonian admiral, down the Indus, along the Erythrean Sea, and up the Persian Gulf, as far as the mouth of the Tigris. Alexander the Great, having made himself omnipotent by land, resolved to encroach, at least by his lieutenants, on the realms of ocean. He therefore set in motion an expedition for maritime discovery. He sailed at the head of the fleet down the Indus, and gazed upon the expanse of ocean, which the ancients deemed the circular boundary of the world. The ocean had been held, from the oldest times, to be a river running round the earth; which river was bounded by the dark clouds of heaven. Such, we are told, was it depicted on the shield of Achilles, which seems to have presented on its surface, a map of the world, as then known. That this notion was very ancient we learn from the Sacred Writings;—"When I made the cloud the garment thereof, and thick darkness a swaddling-band for it." Job. XXXVIII. 9. The writer of the Book of Job probably lived nearly 2000 years before the birth of our Saviour, Christ.

We find that Alexander, at sight of the crocodiles, for some time confounded the Indus with the Nile; owing pro-

bably to the saying of Herodotus, that the Nile and the Indus were the only rivers, in which the crocodile had been seen. Having arrived at the mouth of the Indus, the Grecian army was terribly alarmed at the sight of the huge and awful billows, which rolled in at the mouth of this river. They had perhaps never seen the ebb and flow of the tide before: so that scarcely any officer of this vast and magnificent army could be got to head the further progress of this enterprise; for all felt doubt and dismay at the sight of the ocean, whose breast heaving, in this part of the globe, with higher tides than in most other seas, seemed to portend celestial vengeance at their impiety in approaching the limit of the world. This horror had been increased by finding, at break of day, their ships, which they had anchored during night, left on dry ground by the ebb of the tide. When, however, Nearchus had accepted the command, and they had got out to sea, the first thing that struck their attention was, that the sun being vertical at noon day, they projected no shadow, and that upon occasion, it even deflected towards the south; that stars which they had seen high up in the northern sky, now decreased in altitude, or sank altogether below the horizon; and that others, never visible before, now rose up in the south. As Nearchus coasted along Gedrosia, now Beloochistan, his sailors saw, for the first time, the whale, spouting out streams of water into the air, which, descending like a whirlpool, so alarmed the sailors, that their navigation would have been at an end, had not Nearchus, by raising the shouts of his men, and the din of trumpets, terrified and scared down the monster of the deep. For a great part of their voyage they found it difficult, or impossible, to procure corn, so that they were reduced to live upon fish; and, worse than all, as these Greeks dolefully complained, on the flesh of turtle, which abounded on the coast!

11. The voyages of Eudoxus now claim our attention. He was a native of Cyzicus, who flourished about 130 years B. C. He seems to have been an officer of fortune. Like many others, whose ardent minds have impelled them to explore, and to relate, things strange and unheard of, he has been misrepresented and ridiculed by the geographers and critics of his time. There is a natural indisposition to believe that which does not accord with one's own experience; through which incredulity we are sometimes as liable to err, as by an unthinking confidence. Bruce, the celebrated traveller, at the end of the last century, who had related the circumstance, not unusual, of an Abyssinian cutting steaks from the flank of a cow, skewering up the wound, and then driving her out to pasture, was thus satirized by the witty poet of the day:—

> Nor have I been where men—what lack, alas!
> Kill half a cow, and turn the rest to grass.

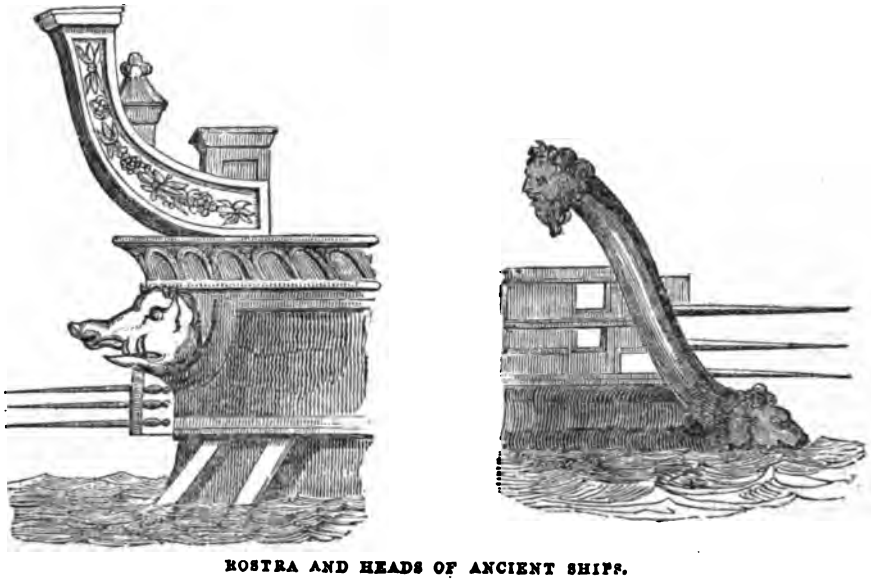
Eudoxus made several voyages down the Red Sea, and towards the East, at the instigation, and with the aid of Ptolemy Euergetes, king of Egypt, and his successor; but, eager to pursue the grand object of nautical honour, the circumnavigation of Africa, he seems to have eschewed royal patronage, and to have set out on his own account, with the assistance of some friends whom he got to join him.

We ought to observe that the traditions, or records, of the circuit of Africa, having been formerly made, were now becoming apocryphal; the geographers of the times having decided that the regions to the south, or the torrid zone, were utterly uninhabitable, by reason of the extreme heat, while the regions to the north, forming the frigid zone, were unapproachable, by reason of the intense cold. They believed, theoretically, that there was another temperate zone, corresponding with their own, beyond the torrid; but that this southern temperate zone was completely severed from the northern by unendurable heat. Hence, in the time of Mela and Ptolemy, it was believed that the ocean passed through Africa, and that the Nile rose in the southern division, and, flowing under the sea, appeared again in Upper Egypt.

For some time all proceeded favourably, until the crew of Eudoxus, fearing lest they should be swallowed up amid the heaving billows of the Atlantic, urged the vessel so close to the shore, that it was stranded on one of the dangerous sand-banks abounding on the coast. A smaller and more compact galley of fifty oars, was formed from the fragments of the stranded vessel; in which ship he continued to proceed southward, but was at last forced to return, his resources not being equivalent to the end proposed, after the disaster of the shipping. He is said to have made a second attempt, with the issue of which we are not so well acquainted. He seems to have been set down as an impostor; and is reported to have told many fables and other absurd stories of his voyages and adventures. According to some, he really made the circuit of Africa. Some nations he found dumb; which relation has in it a stroke of probability, for, not understanding the language of foreigners, the natives might have thought it as well to be silent.

Of some people he related, we are told, that they had no tongues, of others, that being mouthless, they received their food up the nostrils. Some nations, we know, completely cover up the lower parts of their faces; but the account of things originally true, though strange, becomes exaggerated and distorted by passing from one narrator to another. In a word, this navigator seems, by common consent, to have been more meritorious than fortunate.

12. When the Romans began, and continued to practise navigation, it was to serve their purpose of conquest; but, to gratify their luxury, the extremities of the known world were ransacked, and thus maritime enterprise was indirectly promoted. Their ships, when unemployed in war, made a survey of the dominions which their power had acquired. Thus, at the end of the first century of the Christian era, Agricola, the governor of Britain, discovered it to be an island by sailing round it. The opportunity of surveying the coasts of the Erythrean Sea was furnished by the regular trading voyages, undertaken by the Alexandrian merchants from the north of the Red Sea down into the Indian Ocean, which was the ancient Erythrean. The merchant-vessels of the Roman empire seem to have navigated this sea to the right, as far south as the Isle of Madagascar; and to the left, as far as the coasts of



ROSTRA AND HEADS OF ANCIENT SHIPS.

Malabar, of which Arrian, who flourished about A. D. 140, gives us an account, in his work called the *Periplus*, or *Circumnavigation*. The general facts herein related do not differ materially from those which have come under modern observation; the people of the coast are little changed in manners or living, their country has the same appearance, and its productions are much the same as the author of the *Periplus* alludes to.

With regard to the form of the vessels, employed by the Phœnicians and other neighbouring nations, about the same period, it seems that those vessels intended for commercial purposes were without keels, and bore a certain resemblance to the barges of the Hollanders at the present day. They were flat-floored, round, broad, drawing little water, and of very great breadth, in proportion to their length; so that they might be capable of containing a larger quantity of commodities than would be the case under any other form. Their floor-timbers were continuous; and, with the addition of one futtock only on each side (called by the Greeks *encaïia*, meaning the ribs or internal parts of the animal body), the frame was completed.

Before the introduction of the keel, the framework of the vessel was formed of timbers bent round, and kept in the curved form by beams passing across, to which the timbers were bolted; but as this was a laborious practice, the keel became introduced, by which the necessary shape of the frame was more easily ensured. The Latin word for *keel* is *carina*, from *curro*, to *run*, alluding to the mode in which the keel runs or cuts through the water. The frame was covered with planking; the planks being fastened to the frame by large nails or bolts formed of iron, some of which passed through both plank and timber, and were clenched at the end to render the fixture more complete. It has been ascertained, that the mode of dove-tailing, which is now so frequently applied in carpentry, was known in those days; for when the planks were not long enough to reach from stem to stern of the vessel, they were joined end to end, the ends being dove-tailed into each other, by which they were prevented from starting out from their places.

We may here notice, in addition to what was said in the first article, a strange mode of attacking an enemy, as adopted by Hannibal, in a war with Pontus; which was by throwing vessels filled with snakes on the enemies' decks. The ships of Pontus thought it strange to see potters' vessels hanging from the yard-arms of Hannibal's ships; but when those same vessels were thrown on their own decks, and snakes were perceived to crawl out of them, the effect produced was just what Hannibal had anticipated; namely, that the uncommon event frightened and dismayed a brave people, who would not have shrunk from any of the ordinary dangers of war. On other occasions, casks containing inflammable matter were hung from the projecting head of the vessel; and when the head was brought so as to be over the deck of the enemy's vessel, the casks were opened, and the inflammable matter shaken out, and precipitated upon the deck. Sometimes these casks were placed on the ends of long poles, placed across or aslant the deck.

There seems reason to believe that the destructive purposes of war were more conducive to the improvement of ships than was the peaceful object of commerce: accordingly, the strengthening and improvement of the timbers and other parts of a vessel became more and more an object of attention, as nations became more and more involved with each other in political or warlike dissensions. Experiments were made, and experience was appealed to, as to the best kinds of wood for ship-building. The Phœnicians, the Grecians, the Carthaginians, and the Romans, successively directed their thoughts into this channel. The fir was found to be the lightest, as well as the easiest to work: the oak, on the other hand, though more difficult in application, proved to be the strongest and the most durable. Besides these, the elm, the cedar, the cypress, the pitch-pine, the ilex (a species of oak), the ash, and even the alder, were severally tried: the oak, the fir, and the pitch-pine, were those in general use.

As the science advanced in general use and repute, practice and experience introduced certain maxims, some of which were really found necessary, while others were whimsical and capricious. Hesiod, for example, informs us that it was deemed improper to fell any timber for the purpose of ship-building, except on the 17th day of the moon's age, because, it being then in the wane, the sap or internal moisture, which is the grand cause of early decay, would be considerably lessened. Another writer extends the time, and allows that if trees be cut down between the 15th and the 23rd days of the moon, they will endure for a long time without perishing; but he adds that, if that limitation be transgressed, the daily practice and experience of all artisans may convince the world it would become worm-eaten and rotten in an incredibly short space of time. Some supposed that the timber felled on the day of the new moon was absolutely incorruptible; they were even attentive to the quarter from whence the wind blew, and to the season of the year; for instance, in the beginning of Autumn it was deemed improper to fell timber for ship-building, except the wind was westerly, or, in the Winter, unless it blew from the north.

THE ROMANCE OF ANCIENT NAVIGATION, AS INDUCED BY THE DESIRE OF MONOPOLY IN TRADE.

We must now say a few more words on the motives, which are presumed to have led the Phœnicians, and the subsequent mariners of antiquity, to the affectation of mystery and horror, with which they were so wont to shroud all their naval enterprises. The Phœnicians, so celebrated for commerce, and consequently for navigation, whose pilots manned the ships of the nations, and conducted the vessels of Solomon over the Red Sea, the Persian Gulf, and the Mediterranean, as far as Tarshish, "the silver country," are placed even by Homer in a most unfavourably moral light. Iniquity and deceit are their characteristics, both in Sacred and Profane history. Hence the term "Punic faith," as applied to the Carthaginians, implied *treachery*. The especial source, to which the equivocal conduct of the people of Tyre and Sidon may be traced up, is their desire and endeavour to preserve to themselves exclusively the trade and commerce of the world; possessing, as they did, the privilege of serving the Egyptian, and other nations, whose religion deterred them from pursuing maritime enterprises. The people of Egypt had long ceased to cultivate the naval art; for they dreaded the sea, which swallowed up their great divinity, the Nile. This river the Phœnicians were never allowed to enter. In such sort did the Arabians, in after ages, become navigators for the Hindoos, who were superstitiously afraid of the sea. This gave the Phœnicians power, wealth, pleasure; in short, every advantage, whether for good or ill, which this world furnishes. They were also the great slave-traders of the world. Having once attained to this pitch of envied distinction, they could not bear the idea of putting their convenience in jeopardy, as they knew, or fancied, they must do, if rivals competed with them in the foreign markets. This leads us to suspect the motives, which made Hiram, the Tyrian monarch, sneer at the inland cities, given up to him by Solomon. The Phœnicians wanted, doubtless, a harbour for ships, such as that of Joppa. The keenness and activity of the Greeks was justly formidable to them. They therefore went upon a bullying system; and, like arrant braggarts, told how they had met in various climes with—

> The Cannibals, that did each other eat,
> The Anthropophagi, and men whose heads
> Do grow beneath their shoulders.

The Phœnicians, with Tyre and Sidon as their two principal cities, engrossed, as has been before stated, by far the greater part of the commerce of the then known world: they brought the gold, and gems, and spices of the East from India, Persia, &c., to Tyre and Sidon, by caravans or land-carriage, and distributed them to the nations of the West by means of their shipping on the Mediterranean. From an early period, however, they thirsted to gain possession of some port, which should give them a command of the navigation of the Red Sea. This object, for a long time, they could not attain; for the eastern shores of the Red Sea, or Arabian Gulf, were in the hands of the Arabians and Assyrians, while the western shores were in the power of the Egyptians and Ethiopians. They therefore strove to obtain possession of some port on the Mediterranean, near what is now called the Isthmus of Suez, in order that, by a land-carriage of a few miles, they might connect together the navigation of the Mediterranean and the Red Sea. This object they attained by gaining possession of Rhinocorura, a city on the boundary between Palestine and Egypt. By this plan they extended their commerce to a vast extent, by making the Red Sea the channel of communication between Tyre and the eastern countries, instead of transporting their commodities by land.

The jealousy with which the Phœnicians regarded any attempt on the part of other nations to share with them

the advantages and profit derivable from commercial navigation, was strikingly shown in numerous instances. If, at any time, when bound on a foreign voyage, they observed a stranger in company with them, and found him endeavouring to pursue the same track, they immediately altered their intended course, using every possible means to avoid him, and to prevent him from following them; it is even asserted that they often purposely risked the loss of their vessels and their own lives, rather than afford the inhabitants of any other country than their own the smallest opportunity of breaking into their monopoly, or holding any share whatever in the commerce of the world. So fearful were they of rivalship, and so pertinaciously bent were they on keeping everything to themselves, that to add to the natural dangers of the seas, and to increase such discouragement as might prevent other nations from exposing themselves to it, they became pirates, and declared themselves at war, by turns, with every country in the then known world; whenever they met with vessels to which they thought themselves superior in force, and consequently able to overcome.

Terrific accounts of the dangers of foreign navigation were propagated among the lively, but credulous, people of the Morea, who not only received these stories with facility, but added embellishments of their own to that which had already been ungraciously imposed upon them. The Greeks, too, possessing an open and communicative spirit, promulgated these accounts in their various writings; and with all the skill which proficiency in literature could effect. From the Phœnicians, therefore, for evident reasons, nothing to the purpose could be learned. The Romans, by destroying all their records and vestiges of ancient glory, hoped that nothing would be learned from the Carthaginians.

What little knowledge, dimmed by the length of its passage, people had of the East, came to them by commercial transactions. They heard that the precious commodities of the East were obtained under circumstances of peculiar difficulty and peril. So hideous and alarming were the objects to be encountered, after escaping the dangers of the sea, that the task of purveying the desired luxuries was gladly relinquished to those who chose to undergo such danger. The golden sands of India swarmed thickly with ants, as big as foxes; and wonderful caution and expedition was necessary in gathering up the precious dust, loading it on camels, and getting off, before swarms of these monstrous insects should environ and destroy both men and beasts. Cinnamon, Herodotus tells us, was brought from the country of Bacchus, that is, India. It was carried into Arabia by certain birds to form their nests with, which were built on dangerous and inaccessible places. The Arabs would strew large pieces of flesh below their nests, which the birds descending would carry off to their young. The nests would break down with the weight, and an opportunity of gathering up the cinnamon was afforded. Cassia was found on the borders of a lake by persons covered over with hides and skins, to save themselves from the assaults of enormous bats, which occupied the neighbouring trees. The real truth seems to have been since made out; that these celebrated spices, which the Egyptians sought after, and which the Hebrews used in the composition of the holy anointing oil of the tabernacle and of the other sacred things, were brought from the coasts of Malabar, the islands of Ceylon and Sumatra, and other eastern regions, by Arabian merchants, from the earliest times; that the Arabs, in fact, engrossed the East Indian commerce, until the discovery of the monsoons, and navigation had so far advanced, as to enable the Greeks to steer off from the shores of Arabia. For many ages these Arabians were met by the Phœnicians, whose place was afterwards usurped by the Greeks. Whether frankincense came originally from the land of Arabia, or from the mountains of India, as some say, winged serpents were its jealous guardians. We are also told of trees bearing wool for fruit, by which is meant the cotton-trees.

It would be tedious to dwell upon the stories of Sirens, who seduced and changed the hardy mariners into beasts; of one-eyed Cyclops, to whom the human kind were but as insects, and who cut the tallest trees of the forest for their walking-sticks; people with the heads of horses; the pigmies and cranes; confounded perhaps with the monkeys; the horned birds; the Phœnix; the Sphynx,—

> Perverse, all monstrous, all prodigious things,
> * * * * *
> Gorgons, and hydras, and chimeras dire.—Milton.

All such, then, are mere inventions, which arise, as the foregoing pages will show, from fear and misapprehension; in proportion to the ignorance of the mariner, or from his interested and selfish motives.

THE MONSOONS: A KNOWLEDGE OF THE EARTH INCREASED BY NAVIGATION.

The first great natural relief, given to ancient navigation, was the discovery of the trade-winds which prevail in the Indian Ocean. These winds, from the dependence which may be placed upon them, and from their consequent value to navigation, are called *trade-winds*, and extend about thirty degrees on each side of the Equator. These winds, however, maintain their regularity only in the open ocean. Where land breaks the continuity of the liquid surface, great changes are produced; but the most remarkable effects exist in the Indian Ocean. The third degree of south latitude is a boundary between distinct winds; from that boundary northward to the continent of Hindostan, a north-east wind blows from October to April, and a south-west from April to October; while from the same boundary to the tenth degree of south latitude, a north-west wind blows from October to April, and a south-east from April to October. These winds are called *monsoons*. The term *monsoon*, or, according to the Persian, monsum, implies *seasons;* and is so used in the Malayan, *moossin*, and other dialects of the East. The *breaking up of the monsoons*, or periodical changes in the direction of these winds, divides the Indian year into two *seasons*. The monsoons on the eastern side of the globe, originate with the trade-winds, of which they are a species, produced by the diversity of continent and islands, seas and gulfs, in this part of the world. These periodical currents of winds, if noticed by the Arabians, were not made to serve their maritime trade, until the keener enterprise of the West, in the person of Hippalus, about 50 A.D., first ventured to steer off from the Arabian and Persian shores, and to be impelled eastward in the direction of the wind. A voyage which had consumed years, now took up but as many months, by a conformity, on the part of the mariner, with this invariable law of nature. The means of profit and information were now less monopolized, and the West became better acquainted with the inhabitants and produce of the East.

The navigation to the Indies was continued, when the Romans became masters of Egypt, by sailing down the Arabian Gulf, and from thence to the mouth of the river Indus, along the southern coasts of Arabia and Persia. But, under the Emperor Claudius, this route was so far changed, that after emerging from the Arabian Gulf, they cut across the Indian Ocean directly to the mouth of the Indus, by noticing, and taking advantage of, the time when the south-west trade-wind blew. The trade was carried on with India thus:—The goods that were intended for the Indian markets, were embarked at Alexandria, and carried up the Nile, a distance of about three hundred miles, to Coptus. From the latter place, the merchandise was carried on camels' backs to Berenice, a distance of two hundred and sixty miles. Berenice is on the shore of the Red Sea, and there the goods were warehoused, until the proper season for sailing; when they steered for the opposite coast of Arabia, and took on board frankincense, and other Arabian commodities, giving arms, knives, vessels, &c., in return. They now proceeded on their voyage to India; whence, having disposed of their articles of merchandise, and got gold, spices, drugs, &c., in return, they pursued their voyage back to Alexandria, where they usually arrived about December or January. The Indian commodities were conveyed from Berenice to Alexandria in the way before described; and a fleet sailed annually from the latter place to Rome, conveying the treasures of the East.

When the Constantinopolitan empire was formed, by the division of the Roman empire into two parts, their maritime and commercial arrangements were very extensive. One fleet, called the fleet of Alexandria, was destined to bring to the capital the produce of India, as conveyed to the Red Sea. Another fleet was that of Seleucia, on the river Orontes, by which an intercourse was kept up with Persia, and higher Asia. A third fleet was stationed in the Euxine, or Black Sea, by which intercourse could be kept up with the nations of Eastern Europe, while at the same time a check could be given to the ravages of the uncivilized tribes of Scythia.

Various opinions were held by the ancients respecting the form and surface of the earth. The followers of Thales believed the earth to be a sphere; this was about 600 years B. C. The successors of Thales got into the notion that it was of a cylindrical form: some gave it the shape of a drum; others of a cube. Many believed it to be a high mountain, with an infinitely extended base, and that the stars moved round and round its summit; but Heraclides, the disciple of Aristotle, who lived about 335 B. C., actually taught that the earth had the figure of *a ship*. Some Indian sects are said to hold similar opinions. Anaximander, the disciple of Thales, was the first who represented the earth by maps and spheres.

With the improvement of navigation, advanced the knowledge of the earth; both, however, being still imperfectly understood:—witness, Strabo's comparison of the Spanish peninsula to "a hide spread out." The ancients knew that a great boundary to the West was formed by the Atlantic Ocean; but the confines of the earth towards the East they supposed were illimitable. Hence the distance on the earth's surface, measured from W. to E. they termed *Longitude*, or *measurement in length*, which they supposed infinitely greater than the *measurement in breadth* N. and S., which they termed *Latitude*. The knowledge of this began to be made practically useful for fixing the positions of places, hitherto often doubtful, on the earth's surface, by Ptolemy, in the middle of the second century of the Christian era. But this, the most celebrated geographer of antiquity, only approximates towards correctness. The Mediterranean Sea he makes 20° too long; the breadth of the Caspian Sea he makes to exceed the length; and the mouth of the Ganges is placed 46° out of its place. Nor can we wonder that the maps of the ancients should be incorrect, when, not yet possessing the magnetic needle, their sailing bore no reference to the heavens, and their maps were formed from road-books or itineraries, wherein marching distances were set down by the guides of an army; or from a sort of log-book, wherein was inserted the distance the ship had sailed, as calculated from point to point. But it surprises us at learning that the two former errors, mentioned above, were not corrected in modern maps until the first half of the last century.

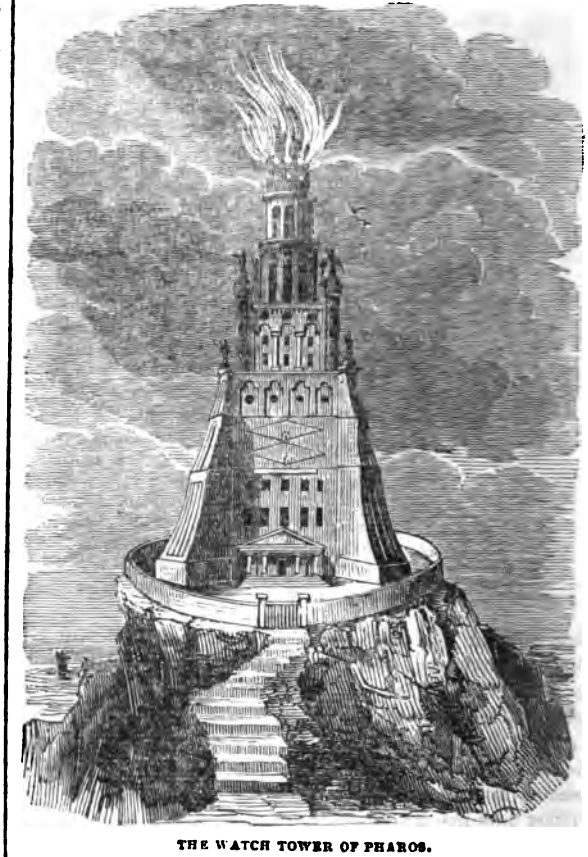
To a nation which has an insular position, or good command of the sea, a naval force (which Themistocles, nearly 500 years B. C., understood the oracle to mean, when it advised the Athenians to defend themselves with wooden walls,) has been found, even from the earliest ages, to be the surest glory and defence. The influence of a state so fortunate has always been most widely and efficiently felt; and its power, whether for good or evil, has always been proportionally increased.

Before concluding, we should observe that it was customary, in ancient times to give an appellation to a vessel, according to the place from whence it started, or according to the purpose to which it was intended to be applied. Thus, Phaselus, a small yacht, pinnace, or pleasure-vessel, was named, in all probability, from Phaselis, a town in Pamphylia, belonging to the Cilicians, where such boats were much in use:—Cydarus, a vessel peculiar to a river in Thrace, of the same name:—Parones, which were small vessels built on the Parian Islands, in the Ægean Sea, the inhabitants of which were much accustomed to use those vessels:—Myoparones, nearly of the same description with those last mentioned, and acquiring their title from the same cause, with the addition of the term Myon, a city in Epirus, where the use of them was much adopted. Cicero states that the name Cybea was applied to a large vessel built for the purposes of merchandise, and so called from the word "cibus," which is the Latin for meat or food. The term Gaulus, was applied to vessels nearly round, somewhat resembling the present jolly-boat, which term was probably derived from the same Latin word, which signifies a *milk-pail*:—the term Corbitæ was applied to such vessels as Cæsar saw when he invaded Britain,—which we have already seen (p. 34) were made of wicker-work,—the word "corbis" signifying a wicker-basket:—Caudicæ, was a term applied to rafts, and was derived from "caudex," the stump or body of a tree:—Hippagines, from *hippos*, a horse, was applied to vessels employed for the transportation of cavalry or horses:—Pontones,—from which is derived the word *pontoons*,—was the term applied to such vessels as were adapted to the passage of rivers. Many others might be enumerated.

The naval art had advanced no further when the Gothic irruptions into the southern climes of Europe, and consequent downfall of the Roman empire, threw Navigation, with all the other arts and sciences, back into their original barbarism. They flourished, however, in another part of the world, whither we must attend their footsteps,—at least when they seek the sea,—and hail their restoration in Europe. But here may properly be drawn the line, which bounds the ancient naval art and practice from that of subsequent times; and the crossing of this line will be the commencement of a dissertation on the navigation of the Middle ages.

THE WATCH-TOWER, OR LIGHT-HOUSE, ERECTED BY PTOLEMY SOTER, ON THE ISLE OF PHAROS, NEAR ALEXANDRIA.—ABOUT 300 B.C.

This was a large building, composed of fine white marble, one hundred and thirty-five feet high, on the top of which fires were constantly maintained, for the direction of ships upon the coast. The expense of this tower was about eight hundred Alexandrian talents, or about 330,000*l.* English. The Isle of Pharos was in the bay of Alexandria, about seven furlongs from the continent, and was joined thereto by a causeway. The tower was accounted one of the seven wonders of the world. The architect, Sostratus, was ordered to inscribe on it, "King Ptolemy, to the gods, the saviours, for the benefit of sailors:" but, wishing to claim all the glory, he engraved his own name on the solid marble, which he covered with cement, on which he formed Ptolemy's inscription. When the cement had decayed by time, Ptolemy's name disappeared, and the following inscription then became visible;—"Sostratus, the Cnidian, son of Dexiphanes, to the gods, the saviours, for the benefit of sailors." Dexiphanes, was he who made the causeway mentioned above. This light-house is alluded to in our last paper, see page 40.



THE WATCH TOWER OF PHAROS.

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CAISTER CASTLE, NORFOLK.

RUINS OF CAISTER CASTLE.

The ruins of Caister Castle, in Norfolk, offer much that is interesting, both intrinsically and historically, to the notice of the antiquarian;—intrinsically, as being the remains of one of the earliest brick buildings in the kingdom; and historically, as being founded by the celebrated Sir John Fastolf, as having been an object of contention between various of the highest families in the county, and as being associated with many of the principal events, as well as personages, in the annals of our country. It is situated about three miles to the north of Great Yarmouth, and about a mile from the coast.

As early as 1363, we obtain notice of the manor of Caister being in the possession of the Fastolf family; but the first mention of erecting any residence appears in the reign of Henry the Fifth, who granted Sir John Fastolf a license "to build it as strong as himself could devise," and appointed it as a fortification to the town of Great Yarmouth. The castle, or "hall," as it is termed by contemporary writers, enclosed a court, in form a rectangled parallelogram, whose north and south sides were longer than the east and west. At the north-west corner is the tower of which we annex an illustration. The grand entrance was over a drawbridge on the west side.

And here it will be as well to introduce Sir John Fastolf to the reader under his real character; since he it is, who in exchange for his own fair celebrity, is indebted to Shakspeare for a notoriety, which clings, with more tenacity than justice, to his name. This hero was born at Yarmouth about, or shortly before, 1380, and, his father dying early, he became, according to the custom of the times, the ward of a nobleman and was trained up in the family of the

Duke of Norfolk, whose splendid and numerous retinue appears to have been the polite school of all the squirearchy around. About 1405-6 he appears in Ireland with Thomas of Lancaster, second son to Henry the Fourth, afterwards Duke of Clarence, and then lord-lieutenant of that country. Two years afterwards he married, in Ireland, Milicentia, daughter of Sir Robert Tibelot, and widow of Sir Stephen Scroope, with whom he received a large fortune; and shortly after, obtaining posts of considerable trust in Gascony, he went thither to reside. Here he remained, engaged in all the commotions, civil and military, which mark this period, when England was endeavouring to establish her claims to the possession of France. In 1415 we find him, in conjunction with the Duke of Dorset, intrusted with the government of Harfleur, and subsequently present with Henry the Fifth at the battle of Agincourt, on which occasion he especially distinguished himself. After the death of this young monarch he continued to be promoted to posts of higher importance and honour, and to distinguish himself by such services of bravery and danger, as, in 1425, procured him the order of the Garter. In 1428 he gained great honour at the memorable battle of the Herrings, in which, at the head of 2500 Englishmen, he totally routed 4000, or, as some of the French historians admit, 9000 of the French, and succeeded in conducting a convoy of provisions, (consisting chiefly of herrings,) in triumph to the English camp before Orléans.

The character of this brave warrior, however, here suffers a partial eclipse, for we find him sharing in the universal panic which infected the English forces, before the mysterious power of the Maid of Orléans. But with returning fortune his name resumed its lustre; and after a period of active service, he concluded his career with a succession of diplomatic and civil employments. In 1435 the Duke of Bedford, Regent of France, dying, gave a manifest proof of the esteem in which he had held Sir John, by leaving him one of his executors. In 1436 for the space of four years he appears settled in the government of Normandy; after which, in 1440, he finally returned to his native land, and abode in his different estates, but principally in his hall of Caister, where he lived in great splendour and hospitality. He died in 1459, full of years and worth, and was buried in a chapel, erected by himself, in St. Bennett's Abbey, Norfolk, the ruins of which yet remain. He had been twice married, but left no children. The greater portion of his immense fortune was bequeathed to charitable purposes, in which the universities of Oxford and Cambridge largely shared, and especially Magdalen College, Cambridge.

Much has been said to prove Shakspeare's injustice in his character of Sir John Falstaff, as represented in his *Henry the Fourth* and *Fifth*, &c.; but herein the same charge of injustice may extend to the critics themselves: for, setting aside the inaccuracy of name, and anachronism of date, it by no means appears that in the person of the unwieldy buffoon, who amuses us equally with his jests and cowardice, Shakspeare ever intended to depict the great and good Sir John Fastolf, celebrated alike in field and council, feared by his enemies, and beloved by his friends. A version more agreeable to probability and history is, that the character of Falstaff was originally written and acted under the name of Sir John Oldcastle, but, imagining it might give offence to the Oldcastle family (then living), Queen Elizabeth ordered our bard to substitute another name. Nor need it be supposed that this buffoon notoriety was more applicable to the real identity of Sir John Oldcastle, with whom, except in point of age, it no better agreed.

And now, having endeavoured to justify the character of this hero of olden time, we must also clear the history of his castle of Caister, from some errors which attach to it. One of them consists in a fallacious idea entertained by some writers, that the castle of Caister was built as a ransom by the Duke d'Alençon, taken prisoner by Sir John, at the battle of Agincourt,—a supposition which is refuted by a letter from Sir John, dated from Caister Hall, 1456, wherein he sues for the money due to him for the said ransom. Another error respects a supposed similarity between the castle of Falaise, in Normandy, the birth-place of William the Conqueror, and that of Caister; the latter being said to built on the exact model of the former; but this is easily refuted by those who have visited both, and enough remains of each to prove that no such correspondence ever existed. The only analogy between them consists in a solid tower, and other apartments, having been added to Falaise about the period of the erection of Caister, by the famous Talbot, Earl of Shrewsbury, contemporary, and companion in arms, with our Sir John Fastolf.

Much light has been thrown on the history of this castle, and the families connected with it, by *The Paston Letters* edited by Sir John Fen; a collection of the most valuable private correspondence during the eventful period included between the reigns of Henry the Fourth and Henry the Seventh.

From this correspondence we find Sir John living in great splendour, keeping up a large body of retainers, engaged in active charity, and in plans for testamentary benefactions, but nevertheless adding yearly to his estates, and administering, and exacting justice in a manner which shows the stern old disciplinarian, as well as the kind friend and master. These were the prosperous days of old Caister; for Sir John's death, while it enriched many excellent public institutions, and diffused much private comfort, gave rise to that usual average of evil, which, four hundred years ago, accompanied the best intentions and deeds, much the same as it does at the present day. His ample estates were chiefly vested in charitable endowments, while that of Caister was left to his cousin, John Paston, Esq., on condition of his maintaining with the profits therefrom, a "college," or rather chapel for seven priests, and seven poor men,—a foundation which the knight had laboured to obtain during his life-time, and which it appears the Pastons succeeded in establishing, though not till after the lapse of many years, and innumerable difficulties in obtaining the necessary grant.

To detail and elucidate the various plots, open and secret, to dispossess the Pastons of their rightful inheritance—how kings and commons played into one another's hands, and used or abused the law as their interests required, and how all this occurred at a time when the kingdom was torn with civil wars, and the faction of York and Lancaster alternately ascendant, is no easy task. The Duke of Norfolk, then a prince of almost unlimited power, and chiefly resident at his castle of Framlingham, in Suffolk, had, it appears, for some time kept a longing eye upon the fair estate of Caister, and shortly before Sir John Fastolf's death, we find Agnes Paston, widow of Sir William Paston, judge, thus writing to John Paston her son,—

It is said in this country, that my lord of Norfolk saith, Sir John Fastolf hath given him Caister, and that he will have it plainly.

This same John Paston, therefore, a man it appears universally respected, inherited with Caister, a weight

and succession of cares, which left him no rest to mind or body. His affectionate wife writes to him,—

And, at the reverence of God, sloth not your matters now, but make an end to them; either purvey you to make or mar them in haste, for this is too horrible a cost and trouble that ye have and have had, for to endure any while; and it is great heaviness to your friends, and great joy and comfort to your enemies. My lord of Norwich (the Bishop of Norwich,) said to me, that he would not abide the sorrow and trouble that you have abiden, to win all Sir John Fastolf's goods —God be your speed.

Through the machinations of powerful enemies John Paston was soon thrown into the Fleet, and though soon liberated, he died, worn out with care, after seven years of precarious possession. Caister then descended to his son, Sir John Paston, a soldier and knight, and quite a gallant of his time, who was principally stationed at Calais, but who, however, set great store by his estate at Caister.

About this time, 1468, Thomas Howys openly and unwarrantably proffered to sell the estates of Caister to the Duke of Norfolk, making, on that occasion, most insulting mention of a "pretended bargain, by which John Paston, in his lifetime, thought to have secured all my Master Fastolf's land in Norfolk and Suffolk." Fortified by this nominal and illegal purchase, the duke soon resorted to opener means. At the same time Fastolf of Longshawe, a relation of the late knight's, threatened largely to attack the place, though it does not appear that he ever proceeded to such extremities; and a report went abroad, that Richard, the infamous Duke of Gloucester, also intended possessing himself of Caister. At length, in 1469, the duke threw off all disguise, and openly summoned "John Paston, with his fellowship," to quit Caister at fifteen days' notice. Caister was meanwhile occupied by John Paston the younger, a brother, though of the same name, to Sir John Paston, then at Calais, and he, determined to defend the place, thus writes to his brother;—

And how that my demeaning shall be it is too late to send to you for advice, wherefore, if I do well I ask no thank, and if I do ill, I pray you lay the default on over little wit; but I purpose to use the first point of hawking, to hold fast if I may.

And hold fast he certainly did, with his little garrison of twenty-eight against a regular siege of 3000 troops, headed by Sir John Heveningham, and joined by many persons of distinction. Whilst the utmost was thus doing to defend the place from within, Sir John Paston was equally indefatigable without. We find him immediately proceeding to lay the matter before the king's council then at York, and moving in his behalf such personages as the Duke of Clarence, the Archbishops of Canterbury and York, the Earl of Essex, &c. Meanwhile the siege commenced.

Whatever the decision of the king's council might be, it would seem that my Lord of Norfolk had no great respect for it, and the siege continuing, we are presented with some interesting letters from Margaret Paston to her son, Sir John, written with all a woman's and mother's anxiety, wherein she gives him report of the death of his friends, the danger and hardships of the survivors, the destruction of the place, and the increasing virulence of the duke. Urged by these and other considerations, and by the delays of his powerful friends, Sir John desires Writtill to ascertain the precise state of the besieged, and though equally anxious to preserve his patrimony, to keep or yield it accordingly. The matter winds up in a short letter from John Paston the younger, headed, "Caister yielded," acquainting his brother with the bravery of his servants, and of the urgent necessity which compelled them to the deliverance of the place, saying, "We were sore lack of victuals and gunpowder; men's hearts, lack of surety of rescue, were driven thereto to take appointment." The siege of Caister lasted about three weeks, and was concluded at the end of September, 1469.

In disputes of this kind, it seems that with the cause of contention, all animosity also ceased; for, after clearing off a few troublesome accounts still remaining between them, we find John Paston the younger resuming service with the Duke of Norfolk, in whose household he had been reared.

The Pastons continued suing in vain for justice through various channels, and spending their substance in the necessary bribes accompanying such applications, when a catastrophe occurred which turned the scale in their favour. This was no less than the awfully sudden death of the Duke of Norfolk, in January 1475, then a young man of thirty-four years of age.

He left an only daughter, the Lady Anne, sole heiress of his immense possessions, who, in 1477, was married to Richard Duke of York, second son of King Edward the Fourth, she being at that time five years, and he, three years of age, on which occasion he was created Duke of Norfolk. The little duchess, however, died, we believe, before the innocent prince, her nominal husband, who was murdered with his brother in the Tower, 1483. After which, the estates and title of Norfolk came to Sir John Howard, whose mother was aunt to the late duke, and with the Howards it has ever since remained, being a period of eleven generations.

This infantine marriage seems not to have produced the unfavourable result which the Pastons prognosticated, for in June, 1476, Sir John writes, "Blessed be God, I have Caister at my will; God hold it better than it has done before;" on the back of which letter is written, "Caister is gotten agayn," and in the July following, King Edward granted him a warrant under his own hand and privy seal, to take possession of all lands belonging to his late father, &c.

Shortly after this, considerable damage was done to the castle by a girl setting fire to it in making a bed. Sir John dying unmarried in 1479, all the Paston property descended to the same John Paston the younger, who retired to the halls of Caister which he had so valiantly defended. In 1485, he was High Sheriff of Norfolk and Suffolk; in 1487 was knighted, and made knight banneret at the battle of Stoke, by Henry the Seventh, and died in 1503. Caister continued the chief and favourite seat of the Pastons, till Clement Paston, grandson of the last-named, and a great naval commander, built a magnificent hall at Oxnead, in Norfolk, whereupon the residence of Caister gradually fell into decay. The Paston family continued to increase in wealth and importance, intermarried with the first families in the county and kingdom, were created baronets in 1641, and Earls of Yarmouth and Barons Paston in 1679. With the second of that title, who died in 1732, this noble family became extinct in the male line. This earl had greatly encumbered the estates, and at his death they were purchased by Lord Anson, the great circumnavigator.

The village of Caister is also famous as having been the site of a *castra æstiva*, or summer station of the Romans, (see our article on Burgh Castle, vol. xi., p. 177,) from which the place derives its name.

Speak only when you have anything to say which it is desirable to communicate. You do not know what a great gift of God it is, not to be obliged to speak, and to know when to hold your tongue.—St. Gregory; *Book of the Fathers.*

RECREATIONS IN NATURAL PHILOSOPHY.

WE propose, under the above title, to present our readers with a series of very popular papers, on various subjects connected with natural philosophy. As our object is to present the young reader with an easy and agreeable mode of passing his time, and of turning it to useful account, even in the midst of his sports, we shall avoid every appearance of scientific difficulty, which may remind him of work instead of play. Accordingly, we shall adopt no particular arrangement of subjects, but write, from time to time, on such as most readily occur to us; and which we think capable of being best understood, or most likely to afford pleasure. Our experiments will be of such a nature as to be easily repeated, without having recourse to that very expensive gentleman, the philosophical instrument maker. We therefore begin by requesting the young experimentalist to provide himself with some of that cheap and abundant blessing—water—for we are going to talk to him of

I. THE SIPHON.

MOST persons who inhabit a city or large town, such as London, have seen a distiller's wagon in the streets, with men drawing off spirits from casks into copper vessels, through bent copper tubes; most persons, we say, have seen this; but very few understand the curious law by which fluids admit of being removed from one vessel into another in this way. If we look at the manner in which it is done, we find that the pipe ascends from the upper part of the cask; and is not inserted into the lower part; and, in that respect, differs from all our common notions as to the manner in which liquids move.

Why is it that the water will not flow out of a tea-kettle while on the fire, into our tea-pots, unless, by applying our hand to the handle, we bring the spout of the kettle to a lower level? It is that water, under general circumstances, will not ascend, but will constantly strive to attain a lower position. The tinman, therefore, who, without being much of a philosopher, perfectly well knows that such is the property of liquids, makes the mouth of the spout of the kettle higher than the body of the kettle, in order that, although full of water, it may not overflow. The manner in which cocks are fixed into our cisterns and water-butts, the care which we take to prevent any holes being made in the sides of a vessel containing water, &c., all show that we constantly act from a knowledge of the circumstance, that water will descend whenever an opportunity for so doing occurs; but that it shows no tendency to ascend. How is it, then, that the distiller is enabled to draw liquor from a cask by a pipe fixed into the top of the cask instead of into the bottom? This we will now answer.

The air which we breathe, and by which we are always surrounded, is a material substance, although we cannot see it. A gallon of it weighs about a quarter of an ounce, and presses on other bodies in that proportion. A milkmaid, while carrying her pail upon her head, when going to milk cows, thinks that she has an empty pail upon her head, and only bears the weight of the pail: but such is not the case; she carries a pailful of air besides the pail itself, the air weighing from an ounce to two ounces. It is very true that this is a small amount of weight; but it produces an important effect when witnessed in the grand processes of nature. The atmosphere is about fifty miles in height from the earth's surface; but it gets so much thinner or lighter as we ascend, that if the whole were of the same density as at the earth's surface, a mass of air only five miles high would weigh as much as that of the whole fifty miles now does, as it is really constituted.

Now this weight acts as a pressure upon all bodies at the earth's surface; and it is precisely this pressure which makes water ascend in the siphon or bent tube of the distiller. The shorter leg of the siphon is, in the first intance, inserted into the bung-hole of the cask, the other end being closed by means of a cock. A small tube is inserted at the side of the siphon above the cock, and passes a little way into it. To the free end of this small tube the man applies his lips, and sucks out the air, the spirit in the cask being pressed upon by the atmospheric air, a portion of it rises up the tube, passes over the bent part, and falls down to the closed end of the siphon; on opening the cock the spirit flows out, and the cask would be almost entirely emptied of spirit, unless the flow were regulated by the turning of the cock at the long end of the siphon.

Let us illustrate this by a figure. The annexed cut represents a vessel, with a siphon F G H inserted

Fig. 1.

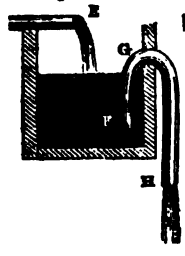
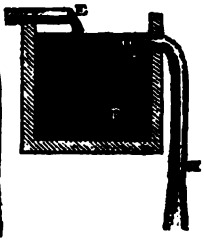


Fig. 2.



in one side of it. In fig. 1 the vessel is rather more than half filled with water, and in fig. 2 it is nearly full. The pipe E we will supose to be for the purpose of conveying water into the vessel. Now as soon as there is enough water in the vessel to reach up to the point F, that is, to the mouth of the siphon, the water begins to ascend the tube; and if the vessel gets so full that the water is as high as the top of the siphon, as in fig. 2, it will immediately begin to flow down the outer leg of the siphon, and escape at the end H; but so long as the height of the water is, as in fig. 1, less than the height of the siphon, the water will not flow through the tube, provided the bent part of the siphon contain air; because that air will act on the water in the inner leg of the siphon, as much as the exterior air acts on the water in the vessel, and will prevent it from flowing outwards. But if the siphon, before it be introduced into the vessel, be inverted and filled with water, the water from the vessel will flow through the siphon, even if there were only just enough water to cover the mouth of the siphon at F. If the conduit pipes F and E be of the same bore, that is, of the same breadth or diameter, as the siphons, the water will flow out as quickly as it flows in. If the conduit-pipe be of larger bore than the siphon, the latter will not draw off the water quick enough, and the vessel will soon overflow. If the conduit-pipe be of smaller bore than the siphon, the vessel will be emptied down to F; air will then enter the siphon, and no more water will flow from it until the level of the water in the vessel and in the siphon has reached to G. All these conditions, however, are subject to modifications depending upon the rapidity with which the water flows into the cistern from the conduit-pipes.

We now understand the action of the distiller's siphon. The inner leg of the siphon dips into the liquid in the cask; and the air which presses on the liquid in the cask forces it up the siphon, because the latter, being full of liquid, cannot allow the air

to press in an opposite direction. It must always be understood, however, that the mouth of the outer leg of the siphon must be at a lower level than the surface of the liquid in the vessel, or the liquid will not flow through the siphon.

This property of water is the source of one of the grandest, as well as one of the most valuable, phenomena of nature: we mean the formation of springs and fountains. The rain which descends from the clouds, falls, some on hilly districts, and other portions on plains and valleys. That which falls on hills is partially absorbed by the soil, and a number of minute streams combine to form a reservoir, which frequently exists in the bosom of a mountain. From this reservoir streams descend through the sandy strata, following the windings of those kinds of soil, or earth, or gravel, which will admit them to pass most easily. These little streams may thus descend and wind, until they arrive under the surface of a neighbouring valley: when, if the soil above them be porous, they will rise to the surface and exhibit themselves to us under the form of bubbling streams. The reason why the water rises to the surface is, that all the little channels leading from the reservoir to the spring, form collectively a sort of siphon turned upside down, because there is a continuous stream of water from one end of the siphon to the other.

If the soil on the surface of the valley lie on a chalky foundation, the little streams will probably be unable to penetrate upwards through the chalk; but if a well be dug at that part, a hole or passage is prepared for the water, through which it will ascend. If the reservoir in the neighbouring mountain be under the level of the valley, the stream will form a well; but if it be at a higher level, the stream will form a fountain, because the water will strive to reach as high a level at the valley as at the mountain.

The poet Thomson, in some beautiful lines, thus describes the above phenomenon:—

> These roving mists, that constant now begin
> To smoke along the hilly country; these,
> With weightier rains and melted Alpine snows,
> The mountain-cisterns fill, those ample stores
> Of water, scooped among the hollow rocks,
> Whence gush the streams, the ceaseless fountains play,
> And their unfailing wealth the rivers draw.
> Some sages say, that, where the numerous wave
> For ever lashes the resounding shore,
> Drilled through the sandy stratum, every way
> The waters with the sandy stratum rise;
> Amid whose angles infinitely strained,
> They joyful leave their jaggy salts behind,
> And clear and sweeter as they soak along:
> Nor stops the restless fluid; mounting still,
> Though oft amidst the irriguous vale it springs;
> But to the mountain courted by the sand,
> That leads it darkling on in faithful maze,
> Far from the parent-main, it boils again
> Fresh into day; and all the glittering hill
> Is bright with spouting rills.

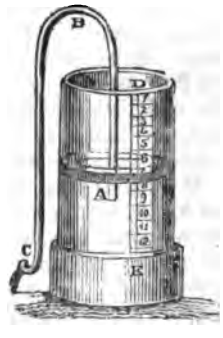
The property which enables liquids to flow from one vessel into another through a siphon, was taken advantage of to form a rude kind of clock, before our present admirable watches and clocks were invented. To explain how this was done, we must first consider another mode of attaining the same object. Fig. 3, is a Clepsydra, or Water-Clock. It consists of an upright hollow tube, with a little hole in the bottom, and an open vessel placed underneath. The hole in the bottom of the tube is so small, that the tube-full of water takes twelve hours to flow out. The tube is filled with water at a certain hour, and when the water has all flowed out, it indicates that twelve hours, or half a day, have elapsed. But how shall we know when one, or two, or three hours have elapsed? If the water flowed through the hole with a constant rapidity, it would be sufficient to divide the height of the tube into twelve equal parts; and we should know that when one of those divisions was emptied, one hour had elapsed; when two divisions were emptied, two hours had elapsed, and so on. But such is not the case: the water flows more rapidly when the tube is nearly full than when it is nearly empty; indeed, so great is the difference, that if the tube were twelve inches high, almost two inches of water would flow out in the first hour, and only one-twelfth part of an inch in the last hour

Fig. 3

It therefore became necessary, in order to make this water-clock indicate correct hourly intervals, to divide the height of the tube into twelve unequal divisions, the smallest being at the bottom, and increasing upwards in length according to a certain law of increase; this we see roughly indicated in our engraving.

But it was not always easy to graduate the tube in the exact proportion desired; and, in order to obviate the necessity of so doing, the principle of the siphon was employed, as in the annexed figure, fig. 4. Here D E is an open vessel for containing water, and A B C is a siphon, with the outer opening C at a lower level than the inner opening A. On filling the vessel with water, and immersing the shorter leg of the siphon in it, the water will flow through the siphon, and escape at the lower orifice C, provided, of course, the siphon be properly prepared by being full of water before the short leg is immersed in the vessel. In this way the vessel may be completely emptied of its water

Fig. 4.



We have now to inquire whether the water flows at an equal velocity through the siphon at all times; for if such is not the case, we shall be as far off as ever from obtaining a correct time-measurer. Now such is not the case, unless the lower orifice C of the siphon is at a constant distance below the surface of the fluid in the vessel: as that distance increases, so does the rapidity of the flow through the siphon increase. In order, therefore, to keep this distance always equal, the shorter leg of the siphon is fixed through a flat piece of cork, which floats on the surface of the water; so that as the water sinks the siphon sinks with it, and the consequence is, that the water flows with a constantly equal rapidity through the siphon.

This we perceive is precisely the object which we desired: the vessel loses equal portions of water in equal times. If, therefore, the height of the vessel be divided into twelve equal parts, either one of the divisions will be emptied of its water in an hour; for the diameter of the siphon, and the size of the vessel, are so adjusted, as to cause the whole of the water to flow out in twelve hours. If the vessel is filled with water at noon, one-twelfth will have flowed out by one o'clock, and the surface will be at 1, as in the figure. We have represented the cork-float at between the levels of 7 and 8; it is thus indicated that nearly two-thirds of the water have flowed out, and that nearly two-thirds of twelve hours have elapsed in the flowing, which indicates likewise that the time is now between seven and eight o'clock.

These are some of the means by which our forefathers measured the flight of time; but the almost magical performance of a modern watch or clock has completely driven the water-clock out of the field; and it is only now known as a curiosity—as a relic of ancient ingenuity.

The reader may see the action of the siphon by taking a bent tube and placing one end into a vessel of water, and inserting the other end into his mouth; on withdrawing the air the water will pass over the bent part of the tube into his mouth, and if the latter be removed, the water will continue to flow until the vessel is empty, provided the outer end of the tube be always below the level of the water in the vessel.

THE HEAD OF THE ELEPHANT.

A VULGAR admiration is excited by seeing the spider-monkey pick up a straw or a piece of wood, with its tail; or the elephant searching the keeper's pocket with his trunk. Now, fully to examine the peculiarity of the elephant's structure, that is to say, from its huge mass to deduce the necessity for its trunk, would lead us through a train of very curious observations to a more correct notion of that appendage, and therefore to truer admiration of it.

We find that one of the grinders of the elephant weighs seventeen pounds; and of these there are four in the skull, besides the rudiments of others. We next observe how admirably these grinding-teeth are suited to sustain great pressure and attrition. The jaws must be provided to give deep socketing to such teeth: and they must have space and strength to give lodgment and attachment to muscles sufficient for moving this grinding-machine. The animal must have its defence too. Now each of the tusks sometimes weighs as much as one hundred and thirteen pounds: and being projected, they may be considered as if placed at the end of a lever. If this enormous and heavy head had hung on the end of a neck having anything like the proportion in its length, which we see, for example, in the horse, it would inordinately have increased the pressure on the anterior extremities; and more than four times the expenditure of muscular power would have been necessary to the motion of the head. What has been the resource of nature?

There are seven vertebræ of the neck in this animal, the same number that we find in the giraffe; but they are compressed in a very remarkable manner, so as to bring the head close upon the body: and thus the head is, as it were, a part of the body, without the interposition of the neck. But the animal must feed: and as its head cannot reach the ground, it must possess an instrument like a hand in the proboscis, to minister to the mouth, to grasp the herbage, and lift it to its lips. Thus we perceive that the form of the elephant, as far as regards the peculiar character in the shoulders and head, the closeness of the head to the body, the possession of the proboscis, and the defence of that proboscis by the projecting tusks, is a necessary consequence of the weight of the head, and, indeed, of the great size of the animal.—BELL *on the Hand.*

MORNING SOUNDS.

BUT who the melodies of morn can tell?
The wild brook babbling down the mountain's side;
The lowing herd; the sheepfold's simple bell;
The pipe of early shepherd, dim descried
In the lone valley; echoing far and wide
The clamorous horn along the cliffs above;
The hollow murmur of the ocean-tide;
The hum of bees; the linnet's lay of love;
And the full choir that wakes the universal grove.

The cottage curs at early pilgrims bark;
Crowned with her pail the tripping milk-maid sings;
The whistling ploughman stalks afield; and, hark!
Down the rough slope the ponderous wagon rings;
Through rustling corn the hare astonished springs;
Slow tolls the village-clock the drowsy hour;
The partridge bursts away on whirring wings;
Deep mourns the turtle in sequestered bower;
And shrill lark carols clear from her aërial tower.—

BEATTIE.

DANGERS OF MORAL SENTIMENT UNACCOMPANIED BY ACTIVE VIRTUE.

OF the various appearances of melancholy weakness in youth, none is more general or more fatal to every duty or hope of the Christian, than that, where the youthful taste is exalted above the condition in which life is to be passed. The faithful parent, or the wise instructor of the young, will ever assiduously accommodate the ideas of excellence to the actual circumstances and the probable scenes in which their future years are to be engaged; and every condition of life undoubtedly affords opportunities for the highest excellence of which our nature is susceptible. If, on the other hand, these hours are neglected,—if the fancy of youth be suffered to expand into the regions of visionary perfection,—if compositions which nourish all these chimerical opinions are permitted to hold an undue share in the studies of the young,—if, what is far more, no employment of moral labour and intellectual activity are afforded them to correct this progressive indolence, and give strength and energy to their opening minds, there is much danger that the seeds of irremediable evil are sown, and that the future harvest of life will be only feebleness, and contempt, and sorrow.

If, in the first place, it is to the common duties of life they advance, how singularly unprepared are they for their discharge! In all ranks and conditions, these duties are the same; everywhere sacred in the eyes of God and man; everywhere requiring activity, and firmness, and perseverance of mind; and everywhere only to be fulfilled by the deep sense of religious obligation. For such scenes, however, of common trial and of universal occurrence, the characters we are considering are ill prepared. Their habits have given them no energy or activity; their studies have enlightened their imaginations, but not warmed their hearts; their anticipations of action have been upon a romantic theatre, not upon the humble dust of mortal life.

It is the fine-drawn scenes of visionary distress to which they have been accustomed, not the plain circumstances of common wretchedness. It is the momentary exertions of generosity or greatness which have elevated their fancy, not the long and patient struggle of pious duty. It is before an admiring world that they have hitherto conceived themselves to act, not in solitude and obscurity, amid the wants of poverty, the exigences of disease, or the deep silence of domestic sorrow. Is it wonderful that characters of this enfeebled kind should recoil from the duties to which they are called, and which appear to them in colours so unexpected?—that they should consider the world as a gross and vulgar scene, unworthy of their interest, and its common obligations as something beneath them to perform; and, that, with an affectation of proud superiority, they should wish to retire from a field in which they have the presumption to think it is fit only for vulgar minds to combat?

If these are the opinions which they form on their entrance upon the world and all its stern realities, it is the "fountain from which many waters of bitterness will flow." Youth may pass in indolence and imagination, but life must necessarily be active; and what must be the probable character of that life which begins with disgust at the simple but inevitable duties to which it is called, it is not difficult to determine.

From hence come many classes of character with which the world presents us, in what we call its higher scenes, and which it is impossible to behold without a sentiment of pity, as well as of indignation;

in some, the perpetual affectation of sentiment, and the perpetual absence of its reality; in others, the warm admiration of goodness, and the cold and indignant performance of their own most sacred duties; in some, that childish belief of their own superior refinement, which leads them to withdraw from the common scenes of life and of business, and to distinguish themselves only by capricious opinions and fantastic manners; and in others, of a bolder spirit, the proud rejection of all the duties and decencies which belong only to common men,—the love of that distinction in vice which they feel themselves unable to attain in virtue, and the gradual but too certain advance to the last stages of guilt, of impiety, and of wretchedness. Such are sometimes the "issues" of a once promising youth! and to these degrees of folly or of guilt, let the parents and the instructors of the young ever remember, that those infant hearts may come, which have not been "kept with all diligence," and early exercised in virtuous activity.

Amid these delusions of fancy, life, meanwhile, with all its plain and serious business is passing; their contempories, in every line, are starting before them in the road of honour, of fortune, or of usefulness; and nothing is now left them but to concentrate all the vigour of their minds to recover the ground which they have lost. But if this last energy be wanting—if what they "would," they yet fail to "do," what, alas! can be the termination of the once ardent and aspiring mind, but ignominy and disgrace? a heart dissatisfied with mankind and with itself; a conscience sickening at the review of what is passed; a failing fortune; a degraded character; and, what I fear is ever the last and the most frantic refuge of selfish and disappointed ambition,—infidelity and despair.

It is ever painful to trace the history of human degradation, and it would even be injurious to religion and virtue to do it, if it were not at the same time to exhibit the means by which these evils may be prevented. Of the character which I have now attempted to illustrate, the origin may be expressed in one word: it is in the forgetfulness of duty, in the forgetfulness that every power, and advantage, and possession of our being, are only trusts committed to us for an end, not properties which we are to dispose of at pleasure; in the forgetfulness that all our imaginary virtues are "nothing worth," unless they spring from the genuine and permanent source of moral and religious obligation.

Wherever, indeed, we look around us upon general life, we may everywhere see, that nothing but the deep sense of religion can produce either consistency or virtue in human conduct. The world deceives us on one side,—our imaginations on another,—our passions upon all. Nothing could save us; nothing, with such materials, could hold together even the fabric of society, but the preservation of that deep and instinctive sense of duty, which the Father of nature hath mercifully given to direct and illuminate us in every relation of life; which is "none other" than his own voice; to which all our other powers, if they aim either at wisdom or at virtue, must be subservient; and which leads us, if we listen to it, to everything for which we were called into being, either here or hereafter.—ALISON.

GUILT, though it may attain temporal splendour, can never confer real happiness. The evil consequences of our crimes long survive their commission, and, like the ghosts of the murdered, for ever haunt the steps of the malefactor. The paths of virtue, though seldom those of worldly greatness, are always those of pleasantness and peace.—SIR WALTER SCOTT.

THE NESTS OF WASPS.

THE honeycomb of the bee is well known, and the instinct by which the insect has been taught to construct its curious dwelling, has been often commented upon. It is not so generally known that many species of wasps, who live in societies, prepare habitations for their young with a skill, little, if anything, inferior to that evinced by the bee.

The nest of the common wasp is constructed in the earth, the entrance to it is by a hole or gallery worked in, like the entrance to the burrow of a rabbit; this gallery seldom leads in a direct line to the nest, and its length is of course determined by the distance of the nest from the surface, but it appears to be never less than six inches, and seldom exceeds eighteen inches in length.

This gallery leads to a little subterranean town constructed with great regularity. It is surrounded by walls on all sides, the walls not being merely formed by the earth in which the hole is made, but by a substance somewhat resembling paper, consisting of layers, altogether about an inch and a half in thickness. (See fig. 1.) This outward envelope of the nest varies in form and size according to the species of wasp to which the nest belongs; the usual form is that of a lengthened ball, about eighteen inches long, and twelve or thirteen broad. The substance of which its covering is formed, as has already been said, more resembles paper than anything else; it is generally of an ashy-gray colour, of different shades; sometimes its surface appears as if formed of different coloured substances, applied in streaks or wavy lines, so as to have a marbled appearance. The surface of this covering is not smooth, nor does its substance appear solid, but it bears some resemblance to a number of bivalve shells cemented together with their convex sides outwards. When the structure is complete, it is provided with two door-ways, or openings, by one of which the insects enter, but they always leave the building by the other. These openings are only sufficient to allow one wasp to pass at a time, and so great is the regularity of their movements, that no confusion takes place by jostling each other, or by entering at the wrong hole. The interior of the building is occupied by several platforms of cells, placed horizontally, like the segments of a honeycomb, from which, however, they differ in many respects; they are formed of the same paper-like material as the covering of the nest. The segments of the honeycomb are composed of a double series of cells, opening on both their surfaces; the cells of the wasps are in a single series, the openings all on the under side, and the cells contain no honey or other substance, being merely intended for the reception of the eggs and young. These cells are most numerous, and Réaumur has calculated that as many as thirty thousand wasps might be produced in a nest in one year. The upper part of the cells being covered over, affords spacious platforms, on which the inhabitants move backwards and forwards. The intervals between these platforms are ornamented with numerous pillars, by which they are supported. In constructing the comb, the upper and smallest platform is first formed, the second is suspended in the air beneath it, being attached by the pillars. These pillars are formed of the same material as the rest of the structure; the platforms are also attached in some places to the sides of the nest.

If the wall of the nest is cut through its substance, it will be seen that it is formed of numerous layers, leaving small spaces between each layer; as many as sixteen of these have been counted in the covering of

Fig. 1.

SECTION OF THE NEST OF THE COMMON WASP

Fig. 2.

Fig. 3.

Fig. 4.

NESTS OF VARIOUS SPECIES OF WASPS.

a wasp's nest. This structure of the covering appears to be resorted to on two accounts; it requires a smaller quantity of material, and is less easily penetrated by the rain, the intervals between the layers forming so many drains for the moisture.

The material, of which the whole building is formed, is brought home by each wasp in the shape of a small ball, which is carried between a pair of pincers, placed beneath the head, with which at other times the creature divides its food. Supposing a layer begun, which the wasp wishes to enlarge, it presses the little ball, which consists of a soft paste, against one end of the layer, there it adheres, and the wasp moves backwards; as it retreats, it leaves behind it a small portion of its load fixed to the edge of the layer, employing all this time its nippers, as a potter does his finger and thumb in applying more clay to the edge of a vessel. The wasp having moulded the whole of the ball into a flattened layer, advances quickly to the place where it was first attached, and seizing it in its nippers again, retreats quickly, moulding it into a still thinner layer; this operation is repeated four or five times in succession, until it is reduced to the thickness of a sheet of paper.

Réaumur, to whom we are indebted for our knowledge of the mode in which the wasps construct their nests, was, for a length of time, notwithstanding repeated observations, unable to ascertain from what source the insects obtained the substance which they brought home with them. At length accident gave him an opportunity of ascertaining the fact; and he thus explains the circumstance.

After I had discontinued my observations on this description of fly, a female wasp, of the species of which we are speaking, taught me that which I had been so long searching for without success. She placed herself near me on the frame-work of the window, which was open. I perceived that she remained at rest, on a spot from which it seemed impossible she could obtain any succulent substance; while the rest of her body was at rest, I remarked many movements of her head. My first idea was, that the wasp was detaching from the wood some substance with which to build, and I was right in my conjecture. I observed it with attention, and I noticed that while it appeared to be biting the wood, it moved its two teeth with great activity, and cut off extremely fine fibres from the wood. The wasp did not swallow what it removed, but added it to a small mass of the same material, which it had already collected between its legs. Presently it changed its place, but still continued to gnaw the wood, and add to its little stock. Being perfectly satisfied of the nature of its labour, I seized the wasp in the midst of its work. I found it loaded with nearly as much material as these flies are usually in the habit of carrying home to their nest, but it had not yet been formed into the shape of a ball: the substance was not as moist as it is when the insect employs it in its labours.

On examining the mass, he found it to consist of numerous small *fibres* of wood, not *chips*, the insect having first loosened the fibres, and then bitten them off of the necessary length. Fragments of wood, like saw-dust, would not have answered the purpose of the wasp, they would not have interlaced so as to form a paper.

Subsequent observations proved to our author, that these insects were quite as well satisfied to take the fibres from ready-made paper, as to be at the trouble of stripping them from the wood. This he discovered by the noise made by a wasp while robbing the paper squares of a casement in Paris, near which he was at work. The window overlooked the garden, and the paper was much damaged by the numerous wasps who visited the spot.

The hornet, like the wasp, builds its nest in the ground, but other species of this genus attach them to the branches of trees. The engravings, figs. 2 and 3, represent specimens of these nests.

Fig. 2 was about the size and form of a large cabbage-rose. In this instance the cells were arranged in two masses, at the bottom of the cavity of the nest. Fig. 3 shows the form of a wasp's nest from America; the outside of this nest was smooth, and bore a great resemblance to pasteboard. Fig. 4 is a very singular wasp's nest; the cells are unprovided with the usual covering, and attached to the branch of a tree; at a little distance it appears like a flower. Unprovided with the usual covering, these wasps preserve their cells from the effects of the rain by varnishing them, and this seems to occupy a great portion of their time.

As beauty does not consist in taking what lies immediately before you, so neither, in our pursuit of taste, are those opinions which we first received and adopted, the best choice or the most natural to the mind and imagination. In the infancy of our knowledge we seize with greediness the goodness that is within our reach; it is by after consideration, and in consequence of discipline, that we refuse the present for a greater good at a distance. The nobility or elevation of all arts, like the excellency of virtue itself, consists in adopting this enlarged and comprehensive idea, and all criticism built upon the confined view of what is natural, may properly be called *shallow* criticism, rather than false; its defect is, that the truth is not sufficiently extensive.—SIR JOSHUA REYNOLDS.

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THE BERNESE OBERLAND.

JUNGFRAU AND WENGEN ALPS.

THE Canton of Berne, though not one of the three great founders of Swiss independence, is the second in rank in the Helvetic confederation, and by far the first in size, wealth, and power. It comprises within its northern and western boundary part of the Jura, and in its southern and eastern some of the most remarkable of the Alpine chain, the intermediate space consisting of pastoral lowlands, a region of surpassing beauty, which is, however, nearly overlooked in contemplating the stupendous magnificence of the surrounding objects. That part of the High Alps which is included in the Canton of Berne, is usually known by the name of the Oberland, or Highland, of Berne, and of this we propose to give some account.

The Bernese Oberland, then, consists principally of four great valleys, the waters of which are emptied into the common basin of the lake of Thun. The most western, and perhaps the least remarkable of these valleys, is the Simmenthal, which separates the chain of the Stokhorn from that of the Niesen. The second, parallel to the Simmenthal, is the Kanduthal, which rises at the foot of the Gemmi-pass in the Valais. These two valleys pour their united waters into the western side of the lake of Thun, where they form a landscape of meadows of the richest verdure, interspersed with the most picturesque villages. The two other valleys empty themselves into the eastern corner of the lake, and of these, and the surrounding mountains, the Oberland properly consists. The principal of them is the valley of Hasli, which follows the course of the Aar from its source, the other consists of the united valleys of Grindelwald and Lauterbrunnen. Nowhere has nature displayed more magnificence than in this extraordinary region; nowhere can so constant a succession of rock, waterfall, or glacier, be found: the mind, hurried on from one wonder to another, is at first lost in a breathless enchantment, and it requires a continued residence among them to be able to appreciate them thoroughly.

The grand features of these valleys are the mighty granite mountains which encompass them; of which the most remarkable are the following:—

	Feet.
The Finster Aar horn (Dark Horn of the Aar)	14,300
— Jungfrau (Virgin)	13,600
— Eiger	12,900
— Wetterhorn (Peak of Thunder)	12,000
— Schreckhorn (Peak of Terror)	13,200

Besides which, there are many but little inferior in height or sublimity,

The valley of Lauterbrunnen, with its celebrated cascade, the Staubbach, has been already described in the *Saturday Magazine*, Vol. VII., p. 162, we will, therefore, proceed to the valley of Grindelwald, which, though of a somewhat different character, offers even greater beauties and wonders to the traveller. The usual access to it is by the valley of Lütschenen, but the route from Lauterbrunnen by the Wengern Alp, is much the most alluring to the lover of the sublime. The Wengern Alp is opposite to the Staubbach, and it requires two hours' hard labour to attain its summit, but when the atmosphere is clear, the prospect would well repay much greater exertion. For immediately opposite to the spectator rise the three enormous masses of the Jungfrau, Moneh, and Eiger, (the most imposing of the three,) covered with eternal ice, and apparently within his grasp, while the ear is struck with the frequent thunder of the distant avalanche. The effect of an avalanche is much greater to the ear than to the eye, as should the eye happen to catch it, the appearance (unless it is very near indeed,) is precisely that of falling water, whereas the sound, reverberated from a thousand rocks and caverns, is wonderfully awful and sublime.

Till lately, the Jungfrau was thought to be inaccessible, but in 1828, after several ineffectual attempts, a party of Grindelwald chamois-hunters succeeded in attaining the summit, with considerable difficulty and danger. They described the area of the summit as about thirty or forty feet in diameter, and the vast glacier, or rather plain of ice, which reaches from the Bernese Mountains to those of the Valais, as much more extensive than was supposed before. This tremendous phenomenon, must be twenty-five miles in length, by from three to twelve broad.

From the Wengern Alp to Grindelwald, the descent is over the Little Scheideck, on which may be observed the terrible effect of a glacier which fell about twelve years ago. It has been thought that forests were a complete protection against the progress of glaciers, but in the present instance the trees were entirely swept away before the moving mass, while in those parts where it did not touch, the mountain-side is still covered with magnificent pines.

The principal objects of curiosity at Grindelwald are the glaciers, which are well worthy of a visit, and, indeed, are more easily attained than any other in Switzerland. The finest and most delicate turf reaches nearly up to the ice, and wild strawberries and flowers may be gathered within a few yards of it. The principal branch of the Lütchine issues from a natural arch of ice at the foot of the glacier Inférieur, supplied by the constant melting of the ice above. The whole of this glacier is covered with pinnacles thirty or forty feet high, and is intersected with cracks and chasms, from which, in the year 1790, a fatal catastrophe occurred.

A Monsieur Monson, a pastor of the Pays de Vaud, visited the glacier with his guide, and having passed the lower part of it, proceeded to traverse the Mer de Glace. Having placed his "alpenstock" on the edge of one of the cracks, he leaned on it to contemplate the profound abyss, when suddenly the point of the staff slipped from under him, and he fell headlong into the gulf. The body was eventually recovered from the depth of 770 feet, so that consciousness must have ceased long before the unfortunate man reached the bottom.

There are many peculiar usages of the inhabitants of the valley of Grindelwald, of which some account shall be given in a future paper.

THE DUTCH WHALE FISHERY.

THE Whale fishery in Holland dates from the ninth century; and even earlier than that it seems to have been engaged in by the Norwegians. The Flemings of the eleventh, and the Icelanders and Normans of the twelfth century, also took part in it; but no authentic accounts remain of the manner in which it was conducted in those remote times. We know not even how the whales were killed; though we may conjecture that the practice in this respect may have resembled that of the Esquimaux and Aleoutians of the present day. Probably no certain mode of procedure was followed; but whales were attacked and destroyed like beasts of prey by the readiest means that circumstances at the moment might suggest.

The inhabitants of the coasts of the Bay of Biscay are said to have been the first to engage in Whale fishing as a distinct branch of commerce; and indeed, this hardly can be disputed, since so early as the twelfth century, traces of such a commerce may be discovered on those coasts. It is known also that whales used at one time to frequent the bay in great numbers, a fact which admits the supposition that capturing them might have been a great resource for the people as long as those animals remained within a moderate distance, but ceased to be so when, frightened by continual pursuit, they retired gradually northward, and sheltered themselves from the Biscayans, along the coasts of Iceland, Greenland, and Newfoundland. At the close of the fifteenth century that people, as well as the inhabitants of Rochelle, Dunkirk, and other ports, which afterwards shared their fortunes, lost this branch of industry, after having possessed it from the twelfth century.

The Northern Whale fishery commenced in the sixteenth century, and was conducted then as it has been ever since. The first enterprise seems to have been conducted by the English in 1594. About the same period the Dutch also first took part in it, and to them it has been a source of wealth almost ever since. They sent to Biscay, for harpooners, and what they called a *spek-snyder*, blubber-cutter, who was also virtually second captain, for on the ship arriving at its destination, he took the command and directed all the operations. This arrangement was a powerful element of success in the early period of these enterprises. The first expeditions were fitted out by companies chartered by the States; but in 1649, the Whale fishery was declared free, and then it rose to its most flourishing condition. Though privileged companies were at first thought requisite, in order to the surmounting of obstacles with which the fortunes of private adventurers might have struggled in vain, the time for abolishing monopolies had arrived. The original difficulties once overcome, private adventures, less cumbersome and less expensive, still further increased profits which were even then immense. The rigorous economy which distinguished them was seen chiefly in the mode of outfit. The hull of the vessel was supplied by its owner, who also took the command; a master sail-maker furnished the sails, a cooper the hogsheads, and so on. This clubbing of interests obviated the inconveniences arising from the smallness of individual capitals, and goes far to account, as a general principle, for the extraordinary rapidity with which the Dutch advanced in wealth, at a time when money was scarce, and banking operations extremely limited. When the vessel returned, each received his own share of the profits in proportion to his contribution, the sailors themselves receiving shares instead of wages. This mode of procedure increased the number of vessels employed tenfold. They amounted at

last to three hundred, manned by ten thousand seamen, sent out in one year.

About the middle of the seventeenth century, when as yet there was abundance of whales on the coasts of Spitzbergen, the Dutch built forts there, and afterwards added establishments for the preparation of oil, amply providing these with boilers and other utensils for that operation. So opulent had the whale-traders become, that a taste for luxury led them to build a town on that desolate island. Houses were actually constructed upon it within eleven degrees of the pole, fitted up with many of the conveniences enjoyed in Holland, in hopes of enabling their inhabitants to brave the rigours of the climate during all seasons of the year. These habitations were originally constructed piecemeal, in the ship-building yards of Amsterdam, and taken to Spitzbergen at a heavy cost, but the project of living there in Winter proved fatal to the lives of many. This town of theirs they called Smeerenberg, and so entirely has it now dispeared, doubtless in part from the combustible nature of its materials, that the very site it occupied can hardly be ascertained; while Batavia, founded by the same people, at the same time, on the island of Java, is now the centre of Indian trade. The idea, however, of the former of these settlements, be it remembered, was suggested, and the sacrifice of the large amount of accumulated profits which it cost, was made, only in prospect of the place becoming an inexhaustible source of wealth. It was at that time the central point of meeting for all the whaling-vessels; there they met, followed by numerous tenders, charged with victuals and stores of all kinds; so that while the fishing was in full activity, there were good inns, well-furnished shops, and many things else to make life agreeable, particularly to strangers. It was only towards the close of the seventeenth century, on the whales retiring about seventy leagues further north, that Spitzbergen was abandoned. Ham, and some other northern towns alone could compete with the Dutch, who, though they abandoned Spitzbergen, continued in possession of the trade until about the middle of the eighteenth century, when the English, after great sacrifices, got it into their own hands, and it seems not unlikely that they in turn will be supplanted by the Americans.

On retiring from Spitzbergen, the whales were still to be found in the northern parts of the icy sea, on the east coast of Greenland, but now they hardly appear even there. They confine themselves almost entirely to the sea, called Baffin's Bay, which connects with the ocean by Davis's Straits. There they are still to be found in vast numbers, but the icebergs, so formidable in those latitudes, make the fishery dangerous.

I AM by all means for encouraging the contemplation of the celestial part of the world, and the shining globes that adorn it, and especially the sun and moon, in order to raise our admiration of the stupendous power and wisdom of Him who was able to frame such immense bodies; and, notwithstanding their vast bulk, and scarce conceivable rapidity, keep them for so many ages constant both to the lines and degrees of their motion, without interfering with one another. And doubtless we ought to return thanks and praises to the Divine goodness for having so placed the sun and moon, and determined the former, or else the earth, to move in particular lines for the good of men and other animals; and how disadvantageous it would have been to the inhabitants of the earth if the luminaries had moved after a different manner. I dare not, however, affirm that the sun, moon, and other celestial bodies were made solely for the use of man; much less presume to prove one system of the world to be true and another false; because the former is better fitted to the convenience of mankind, or the other less suited, or perhaps altogether useless to that end.—BOYLE.

PRESERVATION OF APPLE-TREES.

MANY a time nave I helped to cut away the branches of decaying apple-trees, and to insert healthy grafts in their places; hoping to restore the tree to the sound and fertile state in which it once had been. Revolving seasons did but tend to show that I had completely lost my time; for the American bug, supposed to have been unknown formerly, in this country, attacked my labours in such formidable array, that nothing could withstand its fury.

Every lover of the orchard must have observed this white pestilence in the enclosures sacred to Pomona. It is seen on the branches and on the bole of the apple-tree in the month of June, when it gives them the appearance of being dotted over with little patches of a downy white.

Long ago I turned my thoughts to the extermination of the spoliator, which had nearly rendered the choicest parts of the orchard a sickly, sad, unprofitable waste. I began by trying to make the branches upon which these diminutive harpies had settled, as disagreeable to them as it were possible, hoping by this manœuvre to starve them out of house and home. With this in view, I applied unctuous preparations to the injured parts of the trees; but finding, in the long run, that this availed me nothing, I made a decoction from walnut leaves, and washed the branches well with it, calculating that the bitterness of the decoction would render the favourite food of the insects unpalatable to them. But I was deceived: the bugs continued their depredations as though no pains had been taken to dislodge them.

The application of the spirit of turpentine killed them at once, and for a few days after it had been applied I was in hopes that their extermination had been effected: but others soon appeared.

Despairing of success, I was on the point of quitting the field, and leaving the bugs in undisturbed possession of it, when I began to conjecture that I had not gone the right way to work. I reflected that none of my applications could have penetrated sufficiently deep into the curved and knotty sinuosities of the diseased parts; and that, on this account, there would be a sufficient force of the enemy left alive to recommence its depredations at the first favourable opportunity. Wherefore I concluded that nothing short of the entire destruction of the eggs, the young, and the adult, could save the trees from ultimate ruin. Knowing that the bug could not exist if totally deprived of air, I resolved to bury it alive; I effected this by an application at once the most easy and simple that can be imagined. It costs nothing.

I mixed clay with water, till it was of a consistency that it could be put on the injured parts of the tree, either with a mason's trowel, or with a painter's brush. I then applied it to the diseased places of the tree, and it soon smothered every bug. A second coat upon the first filled up every crack which showed itself when the clay had become dry; and this resisted, for a sufficient length of time, the effects both of sun and rain. The sickly parts, now effectually freed from the enemy which had been preying upon their vitals, were placed in a state to be cured by the healing process of nature; and that nature has done her duty, my apple trees amply testify.—WATERTON.

WHAT a chain of evils does that man prepare for himself who is a slave to anger! He is the murderer of his own soul, yea to the letter he is so, for he lives in a continual torment. He is devoured by an inward fire, and his body partakes of his sufferings. Terror reigns around him, every one dreads lest the most innocent, the most trifling occurrence, may give him a pretext for quarrel, or rouse him into fury. A passionate man is alike odious to God and man, and is insupportable even to himself.—ST. EPHRAIM; *Book of the Fathers.*

ALL the performances of human art, at which we look with praise or wonder, are instances of the resistless force of perseverance; it is by this that the quarry becomes a pyramid, and that distant countries are united by canals. If a man was to compare the effect of a single stroke of a pickaxe, or of one impression of the spade, with the general design and last result, he would be overwhelmed by the sense of their disproportion; yet those petty operations incessantly continued, in time surmount the greatest difficulties, and mountains are levelled, and oceans bounded, by the slender force of human beings.—JOHNSON.

CHAPTERS ON CORONATIONS. No. I.

INVESTITURE OF A VASSAL KING OF PERSIA.

THE ORIGIN OF CORONATIONS.

THE ceremony of the Coronation is not to be regarded simply as a splendid spectacle, and an imposing form; it is a solemn recognition of the mutual obligations between the sovereign and the subjects, made in the presence of that Almighty Being "by whom alone kings do reign." When God selected Saul to be the first king over his chosen people, we find that "Samuel took a vial of oil, and poured it upon his head, and kissed him, and said, Is it not because the Lord hath anointed thee to be captain over his inheritance?" (1 Sam. x. 1.) From that period, the unction, or anointing with oil, became an important part of the ceremonials used at the installation of kings in Judah and Israel. St. Augustine expressly assures us that this custom was peculiar to the Jews: "Nowhere else," he says, "were kings anointed, than in that kingdom where Christ was foretold, and whence he was to come." The ceremony of Saul's inauguration was a simple recognition: "Samuel said to all the people, See ye him whom the Lord hath chosen, that there is none like him among all the people? And all the people shouted, and said, God save the king." (1 Sam. x. 24.) The ceremonies used at the coronation of David were also unction and recognition, and the forms were used when Solomon was made king, during the life-time of his father. But when Jehoash, being saved from Athaliah's massacre, was anointed king by Jehoiada, we find that several additional forms were used, which deserve attention. "Jehoiada brought forth the king's son, and put the crown upon his head, and gave him the testimony; and they made him king, and anointed him; and they clapped their hands and said, God save the king."

The crown appears to have been taken as a royal ornament, because the circle was regarded as the symbol of completeness and perfection; for the same reason, investiture by the ring was used at a much earlier period: it was by this form that Pharaoh constituted Joseph his viceroy over Egypt. A circlet for the head was used at a very early period in Persia, and probably in Babylonia; but most of the other Asiatic nations adopted the tiara, or fillet, which was bound round the king's head, on his accession, with great solemnity. The Persian received the crown, or, perhaps, we should rather call it the royal circlet, from the hands of the Chief Mobed, or High Priest; but the kings who were vassals to the Persian monarch received this emblem of their royal dignity from the sovereign himself. In the annexed engraving we see one of those vassal princes receiving the regal circlet from the hands of the Persian monarch, who claimed for himself the title of king of kings. The queen also was crowned by the king, and not by a mobed: thus, we read in the Book of Esther, "The king loved Esther above all the women, and she obtained grace and favour in his sight, more than all the virgins; so that he set the royal crown upon her head, and made her queen instead of Vashti." (Esther ii. 17.) We learn, also, from the next verse, that the ceremony of the coronation in Persia was celebrated by a public entertainment, and by various acts of grace and favour. "The king made a great feast unto all his princes and his servants, even Esther's feast; and he made a release to the provinces, and gave gifts, according to the state of the king." (Esther ii. 18.)

The Roman title of emperor originally signified nothing more than commander of an army, and was regarded as inferior to that of king. It will be remembered that Julius Cæsar refused to accept a crown; Mark Antony, in his oration over Cæsar's body, is represented as declaring—

> You all did see that on the Lupercal,
> I thrice presented him a kingly crown,
> Which he did thrice refuse.

In the Western empire, indeed, there seems to have been no established form for the installation of the sovereign; but in the Eastern or Byzantine empire the Roman customs were intermingled with those of the Oriental nations, and the emperors received from the prætorian guards a crown and a sword, which seemed to be a tacit acknowledgment of the right claimed by the soldiers to dispose of the empire. Justin II. deprived the imperial guards of this privilege, under the pretence of giving a religious sanction to the ceremonies of the coronation; and from his time the crown, sceptre, and sword, were publicly given to the emperor by the patriarch of Constantinople, in the church of St. Sophia. The ceremony of anointing was first introduced by Andronicus the Younger, in the thirteenth century, long after it had been adopted in Western Europe; he added this form in order that the soldiers should not revive their claim to perform the coronation, because

that unction and chrism, that is, anointing with oil and ointment, could only be performed by a person of episcopal dignity. The empresses of Constantinople, like the queens of Persia, however, could only receive the crown matrimonial from the hands of the emperor.

The warlike tribes of Germany elected their kings, but they always chose one of royal blood for their sovereign. Indeed, the principles of hereditary and elective monarchy, which now appear so utterly irreconcileable, were so far from seeming inconsistent to our Saxon ancestors, that they insisted on both being united in the person of their monarch, and some traces of this apparent anomaly may be found in the present ceremonials of coronation.

ELEVATION OF AN ANCIENT GERMAN KING.

When the Germans had chosen a king, they prepared a *pavis*, or very large shield, on which they seated the new monarch; and elevating the pavis on the shoulders of the principal officers, carried their king in triumphal procession three times round the army. On these occasions, the Germans used to manifest their spirit of rude independence by playing practical jokes on their sovereign, such as shaking the pavis, and attempting to unseat him. Such barbarous sport had nearly proved fatal to Gunwald, king of Burgundy: he was thrown from the shield, as he was borne round the army a third time, and was so severely bruised that it was feared he would have expired upon the spot. This custom was introduced into England by the Saxons, and it is still preserved in the chairing of successful candidates after elections. Even the spirit of practical jesting was preserved down to the beginning of the present century: within the memory of persons still alive, it was considered rather hazardous to encounter the perils of a popular chairing at Yarmouth or at Norwich.

This custom of elevating the sovereign on a shield, was introduced into the Roman empire a little before its fall; Gordian and Julian were thus proclaimed emperors by their soldiers, who had learned the practice during their campaigns in Germany and Gaul. This custom was also adopted in the Byzantine empire. Cantacuzenus informs us that the emperor was to be elevated on the shield at sunrise; that the fore-part of the shield was to be supported by the emperor's father, if he were alive, and if not, by his nearest male relation; and that the back part was to be borne by the patriarch of Constantinople, and the principal nobles. In this state the emperor was conveyed to the church of St. Sophia, where he was invested with the ensigns of imperial dignity.

In Navarre, the ceremony of elevating the sovereign on the shield was considered of greater importance than the coronation itself. The arms of the kingdom were painted on a shield, which was placed upon the ground in some public place; the king, led by two of the principal nobles, advanced and stepped upon the shield, when it was raised up by six stout slaves, and the monarch was borne in this fashion into the midst of the assembled multitude.

In an ancient law of Don Pelayo, one of the Gothic kings of Spain, we find the following directions for the creation of their kings: "Let the king be chosen and admitted into the metropolitan city of this kingdom, or at least into some cathedral church, and the night before he is exalted, let him watch all night in the church; and the next day, when they come to lift him up, let him step upon a shield or buckler, and the principal men there present shall raise him aloft, and when he is so elevated, the people shall cry, *Real, Real.*"

Among the Jews, the Norwegians, and the Irish, the ceremony of investing the monarch with sovereign power was performed near or at some remarkable stone pillar. Thus Abimelech was made king "by the plain of the pillar that was in Shechem." (Judges ix. 6.) Jehoash, during his coronation, "stood by a pillar, as the manner was," (2 Kings xi. 14;) and Josiah, when he restored the pure worship of Jehovah, "stood by a pillar, and made a covenant before the Lord." (2 Kings xxiii. 3.)

The Norwegians and Danes used to place twelve stone seats in the form of a circle, for the principal nobles, and one in the centre for the king. The royal stone was of great size, and was rudely shaped into the form of a seat. Three of these circles still exist in Denmark, which was anciently divided into three kingdoms: the most perfect of them is that called *Kingstolen* (the royal seat), at Leipa in Zealand; the others are at Lunden in Scania, and Viburg in Jutland.

These stone circles for the installation of kings were introduced into the Shetland Isles, the Hebrides, and the Isle of Man, by their Norwegian conquerors. They were called *Tings*, and the hill on which the stone circle in the Isle of Man was erected, is still called Tinwald Hill.

The Germans adopted this custom from the Norwegians: their *Königstuhl* is near Coblentz upon the Rhine; it consists of seven stone seats ranged in a circle, for the seven electors, and a large stone in the centre for the emperors. In Hungary, the kings took their coronation oath on a stone column. After the monarch had sworn, he mounted a spirited horse, and leaped over a mound of earth prepared for the purpose, after which he ascended the mound, and waved his sword in the form of a cross over the multitude.

The most singular ceremony connected with the stone column was that which took place at the installation of the dukes of Carinthia. A large rock near the city of St. Veit was the place where the installation was performed. On the day appointed for the celebration of the ceremonial, a peasant, who claimed the place by hereditary descent, took up his position on the top of the rock, and had below him, tethered at the base, a black cow, a black calf, and the leanest mare which could be found in the province. A little after sunrise, the duke-elect came out from the city, clad in a peasant's dress, a coarse bonnet on his head, buskins of untanned

leather on his legs, and a shepherd's crook in his hand; but though thus plainly dressed, he was attended by his senators and nobles in their richest robes. When the procession approached, the peasant called out, "Who is this that cometh hither with so much parade and magnificence?" The attendants replied, "This is the prince who claims, as rightful heir, the inheritance of the sovereignty over our good land, the province of Carinthia." The peasant then inquired, "Is he just? Doth he seek the welfare of the Carinthian peasants? Is he of free condition and noble birth? Is he worthy of honour for his past conduct, and doth he desire to win honour by future exploits? Is he obedient to the laws, and attached to the ancient usages of Carinthia? Will he be a defender of the pure and holy Catholic faith?" To this the duke's attendants replied, "Such is he, and such he will be." After a long pause, the peasant renewed the conversation by asking, "Has the lord any right to remove me from this my place?" To which question the attendants replied, "Our lord hath purchased this ground for sixty deniers, and he granteth to thee the animals thou hast with thee, the robes which he wears, and immunity of taxes for thyself and thine house." The peasant then descended from the rock, and gave the duke a slight slap in the face. The duke then mounted the rock, and brandished a sword in the form of a cross over the multitude; water was then brought to him in the crown of a peasant's cap, which he drank as a symbol both of his moderation and humility. The duke then laid aside his peasant's dress, and having received his ducal robes, went and received the sacrament in the church of St. Veit.

The stone on which the ancient monarchs of Ireland were inaugurated, was at a very early period removed to Scotland, whence it was brought to England by Edward I.: it is now fixed in the seat of the coronation-chair, and we shall describe it more particularly in a future chapter.

It only now remains to mention, that the recognition, in the German forms of coronation, was always connected with the semblance of an election, as we find from the speech made by the archbishop of Cologne, when he presented Otho, who was designated emperor during the life-time of his father, to the general assembly of the German princes: "Behold, I bring you here Otho, chosen by God, and appointed by his father, Henry our lord, and now made king by all the princes of the empire. If this election please you, do you signify the same by holding up your hands to heaven." The people consenting, he was then anointed, and invested with the imperial ensigns.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT

No. IV.

HABITUAL USE OF GLASSES — ADJUSTMENT OF GLASSES TO VARIOUS QUALITIES OF SIGHT — NEAR-SIGHTEDNESS — LONG-SIGHTEDNESS.

THE class of persons whose sight is affected by the habitual use of glasses, comprehends a very large number of professions, and presents to the scientific mind points of high interest, while to the general reader the subject is one of paramount importance, as it determines how far the eye is affected beneficially or otherwise by the employment of optical glasses of every description, whether it be the quizzing-glass which the tyrant Fashion imposes on her votary, the sextant of the skilful navigator, or the reflecting telescope of the profound astronomer. The convex spectacle-glasses of the flattened eye of age, and the concave lens of the too convex eye of youth, are alike subjects of import which we propose briefly to consider.

But first it is necessary to remind the reader of the problems connected with vision by which the eye takes cognizance of very distant objects, and has also a distinct appreciation of those within a few inches. It is known that a telescope, microscope, camera obscura, &c., all require to be adjusted before they can be employed, and that this adjustment must vary according as they assist the eye to view near or remote objects: hence the question how is the eye adjusted, or does it require adjustment at all? This question we will answer as fully as the present state of our knowledge of the subject extends.

In the usual state of the eye it is so adjusted, by means of a power of which we are ignorant, as to perceive clearly objects at a very great distance; that is, the crystalline lens is placed as far back as the ciliary process will allow it to go, and in that position, parallel or nearly parallel rays meet in a focus on the retina. If from the distant object we look at something less remote, say a tower a quarter of a mile distant, the crystalline lens is brought slightly forward, in order that the increased path between it and the retina may correspond with the increased divergency of the rays proceeding from the latter object.

Suppose the eye be directed successively to several objects placed at various distances, such as a hill, a tower, a house, a tree, and a man, at the respective distances of ten, five, two, one, and one-half miles. Now it is supposed by some that the healthy eye is adjusted once for all to very remote objects when it is in a state of perfect repose, and consequently that it has a clear view of these objects at different distances without a new adjustment for each. Others, again suppose that the distance between the crystalline lens and the retina is precisely proportioned to each of these distances. Suppose then that such is the case, and that we are ignorant of what these distances really are, we must be altogether unable by any act of the will to adjust the lens. It must, therefore, according to this hypothesis, be adjusted, and that with mathematical precision, by involuntary action, since, in order to get a clear view of those five objects, the lens must be at five different distances from the retina. This we think impossible.

Now the motive power of the lens, the adjusting screw in short, by which it is advanced or sent back, is thought to be the iris, which by its self-acting adjustment to light, influences the motions of the lens, with which it is connected through the medium of the ciliary apparatus, so that when the eye is transferred from the view of a near to a distant object, and *vice versâ*, the pupil undergoes a change, which in its turn effects a change in the position of the crystalline lens, as a necessary consequence. The iris is connected to nerves possessing a high degree of irritability, and it is possible that the stimulant property of light is sufficient, independently of the will, to produce the variations in its diameter, according as the light is abundant or not; but it appears that for short distances the iris has the power of voluntary adjustment, that is, when near objects are to be seen, the crystalline lens is drawn forward by a voluntary action, but we are ignorant of the extent of this voluntary power; and it remains to be shown whether the iris undergoes a change, and consequently the crystalline lens, by the stimulus of light or otherwise, when the eye is transferred from one distant object to another distant object, whose dis-

tance however from the eye is less than that of the first: it seems most likely, that by a combination of voluntary and involuntary actions, the eye is accommodated to varying distances, and that the stimulus of light falling on the iris, or retina, or both, is the main cause of the adjustment of the eye.

Let us now consider a near-sighted eye, or one in which the crystalline lens is too spherical, by which the rays are converged too soon, and cross each other before they reach the retina. Now suppose such an eye is regarding a very distant object, and that the lens is then as far back as it can go, but not far enough back, in order that the focus may attain the retina, the remedy then is, supposing the eye to be otherwise healthy, a concave lens, by means of which the convergency of the rays is delayed, and by a nice adaptation the concavity of the artificial lens may so correct the too great convexity of the crystalline lens, that the foci fall exactly on the retina. Much injury, however, is done to the eye by employing bad glasses, or such as are too concave; the rule is, select such glasses as do not diminish objects seen through them; if they do so they are too concave, and the crystalline lens is brought too near to the pupil, by which means the ciliary muscles are fatigued by too rigid contractions.

Between the age of thirty and fifty, the eyes of most persons begin to experience a remarkable change, which generally shows itself in a difficulty of reading small type or ill-printed books, particularly with candlelight. This defect of sight, which is called long-sightedness, because objects are seen best at a distance, arises from a change in the state of the crystalline lens, by which its density and refractive power, as well as its form, are altered. It frequently begins at the margin of the lens, and takes several months to go round it, and it is often accompanied by a partial separation of the laminæ, and even of the fibres of the lens.

If the human eye (as Sir David Brewster remarks,) is not managed with peculiar care at this period, the change in the condition of the lens often runs into cataract, or terminates in a derangement of fibres, which, though not indicated by white opacity, occasions imperfections of vision that are often mistaken for amaurosis and other diseases. A skilful oculist, who thoroughly understands the structure of the eye, and all its optical functions, would have no difficulty, by means of nice experiments, in detecting the very portion of the lens where this change has taken place, in determining the nature and magnitude of the change which is going on, in applying the proper remedies for stopping its progress, and in ascertaining whether it has advanced to such a state, that aid can be obtained from convex or concave lenses. In such cases, lenses are often resorted to before the crystalline lens has suffered an uniform change of figure or of density, and the use of them cannot fail to aggravate the very evils which they are intended to remedy. In diseases of the lens, where the separation of fibres is confined to small spots, and is yet of such magnitude as to give separate coloured images of a luminous object, or irregular halos of light, it is often necessary to limit the aperture of the spectacles, so as to allow the vision to be performed by the good part of the crystalline lens.—BREWSTER'S *Optics*.

. . . . . This I hold
A secret worth its weight in gold
To those who write as I write now,
Not to mind where they go, or how,
Through ditch, through bog, o'er hedge, and stile,
Make it but worth the reader's while;
And keep a passage fair and plain
Always to bring him back again.—CHURCH'LL.

"You may run from major to minor," says Mrs. Bray in one of her letters to Dr. Southey, "and through a thousand changes, so long as you fall into the subject at last, and bring back the ear to the right key at the close."

THE USEFUL ARTS. No. XXXVII.

THE CARPENTER AND THE JOINER, *concluded.*

THE first and principal tools used by both carpenter and joiner, are *saws*, of different sizes, for reducing the rough wood to the size adapted for the purpose to which it is to be applied. Small, fine-toothed saws, both long and thin blades, termed spring-saws, are used for cutting out small holes in wood, and for analogous purposes, when precision and nicety are required; these spring-saws are sometimes mounted in a frame on the same principle as that of the stone-mason's saw, formerly described but commonly, the blade of the saw, of whatever size it may be, is only fixed on a convenient handle, so that the whole blade of the saw may pass through the fissure it makes in the material. All saws are made of the best steel, highly tempered, so as to recover their form if bent by the resistance of the wood.

Next to the saws and planes, *chisels* are the most indispensable tool to the carpenter. These *chisels* are of different widths, adapted to different uses, and are not only used with a hammer or mallet, as the mason employs them, but simply as cutting-tools, used by hand for finishing the re-entering angles of mortise-holes, or for finishing the ends of pieces of wood too small to be planed.

The carpenter employs *gimlets* for making holes for screws and nails. The gimlet is a short rod of steel, finished at one end into a sharp-pointed screw of one or two turns only, which, acting on the principle of that mechanical power, compels the tool to sink deeper and deeper into the wood, as the tool is turned round; and to enable the workman to turn the gimlet, it is fixed into a cross handle, which, acting as a lever, allows of the friction of the tool being overcome. Just above the screw point, the rod or shaft of the gimlet is *fluted* or hollowed out; the sharp edges of this fluted part cut the hole made by the screw-end larger and smoother, and the hollow receives the chips or shavings cut off, and prevents them from clogging the hole and stopping the progress of the tool.

Augers are large tools shaped like a gimlet, and, acting in the same manner, are employed for making large holes for bolts, spikes, &c. *Centre-bits* are steel tools of different shapes, made to fit into a bent handle something like the letter G, which, acting as a lever, allows of the tool being turned round and round by one hand, while by the other the workman holds the top of the handle steady and vertically over the point of the tool. Some of the *bits* or tools are for cutting out cylindrical holes, and are shaped at the cutting-edge like a chisel, with a small point projecting from the centre of the edge, on which the instrument turns in the wood and acts on the principle of a lathe. On each side this point, the chisel-edge is bent sideways in opposite directions, to allow of its *ploughing* up the wood before it with greater efficacy than it would do if it were not so formed.

The *brad-awl*, or *nail-piercer*, is a short steel wire, sharpened at the point into a flat chisel-edge, and put into a plain turned handle. This edge being pushed into the wood, and the handle turned round, the tool divides the fibre, and makes its way on the simple principle of a wedge, and does not cut away or remove any portion of the material as the above-described tools do.

The carpenter uses nails and screws to fasten the different parts of his work together, and it is necessary to make a hole to receive them before they are driven in, or else the wood would split by the action of forcing the nail or screw into the solid material, and, indeed, it would be impossible to force a screw into the solid wood at all.

The screw is forced into the wood by being turned round and round by means of a blunt chisel called a *screw-driver*, the edge of which is inserted into a notch cut in the head of the screw to receive it.

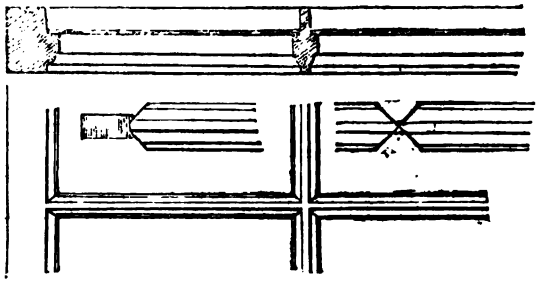
Joiners fasten one piece of their work to another by *glue* made by boiling down refuse animal matter containing the animal principle called *gelatine* in abundance, such as hoofs, horns, tendons, skin, gristle, &c.: it is a property of gelatine to dissolve in hot water, and to harden again when cold, and the water evaporates. Accordingly the glue, which is only concentrated impure gelatine, is dissolved by heat in a small quantity of water, and being applied to the clean faces of the wood to be united, by a coarse brush: these faces are closely pressed and retained together till the water evaporates, when such is the tenacity of the glue, that the wood may be broken in another place as easily as at the glued joint. To enable, glue, however, to act in this manner well, the wood should be clean, the parts to be glued

well warmed before the glue is applied, and the joint should be close, or the parts accurately brought together.

Besides the before-mentioned tools and materials, and some others, such as hammers, axes, &c., which need not be described, carpenters and joiners use instruments for measuring and setting out their work, and for drawing on the surface of the material the forms into which it is to be reduced, or the shape and situations of portions of the material to be removed for the purposes of framing. The instruments are compasses, squares, rules, levels, plumb-lines, and so on, common to all trades which form materials into artificial geometrical shapes: and, like the mason, the carpenter and joiner must be conversant with the more elementary problems of practical geometry.

Having described the principal tools used by this workman, we will return to the work performed by him, and in illustration of the subject, point out the mode of proceeding in making a window-sash, which is one of the most delicate operations in common joiner's-work. The outer part of the sash is made broader and stronger than the intermediate cross-bars which receive the panes of glass, in order to give strength and rigidity to the sash. This outer part is framed together at the four angles by mortises and tenons, the latter coming quite through the stuff, and having a small sharp wedge driven into the middle of the tenon when inserted into the mortise: by means of this wedge, the tenon is expanded at its end into a wedge-shaped form, by which it fits more tightly into the mortise and is retained in its place, the wedge-shape not allowing the tenon to be withdrawn again. But it may be here remarked that, besides this precaution, all small mortises and tenons are put together with glue to ensure the stability of the joint.

The inner edge of this frame is formed by a plane into the half moulding, of which the cross-bars present the entire section, so that when the sash is completed, each panel, as it were, which is filled in with the glass, is surrounded on its sides by a continuous moulding, and on the other side of the frame each panel presents a *rebate* in which the glass lies. The annexed figure of the section of part of the outer frame and one cross-bar, will make this clear.



The cross-bars are made in lengths out of slips of wood, by a plane, which first forms the mouldings and rebate on one side, and then by turning the slip over the same plane, finishes the other with an exact counterpart of the first. These bars are framed into the outer part of the sash by delicate mortises and tenons put together in the manner before described; but it will be seen by reference to the figure, that the moulded part of the bar must unite to that of the outer frame, or of another bar, by a *mitre* joint, that is, by one which allows of the lines of mouldings returning on the second piece, at right angles to their direction on the first, without any interruption to the continuity of the surface.

This and all analogous mitre-joints are formed by planing the ends of the wood to form a face, making an angle of 45° with the axis or length of the stuff, and the joiner is provided with a tool called a *mitre-box*, consisting of a stock or frame, in which the stuff being put, resting against one another's surface, guides the plane so as to cut off the end obliquely at the requisite angle. It is clear that this mitre must be made on both faces of the bar, and therefore the two mitre faces form a wedge-shaped termination by meeting at a right angle, as shown in the last figure. Now as besides the mitre end a tenon is to be left to fit into a mortise in the outer frame, it is clear that the whole must be a very nice piece of workmanship to be executed on so small a material as the thin bar of a modern sash.

The bevelled mitred end of the bar is received into a corresponding shaped notch cut the depth of the half moulding in the outer frame to receive it, and at the bottom of this notch is the fine mortise-hole intended to receive the tenon.

The bars of the sash can, of course, only be made in one length in one direction, and the cross-bars which divide the long panels, formed by these continuous bars, into the sizes of the glass, are made of similar short pieces with mitred ends; but these ends, where they frame into the long bars, have no tenon, the thinness of the stuff not admitting of one, since the cross-bars come, end for end, opposite each other, on the two sides of the upright bars.

It is evident that the long bars must be put together with the outside frame, or else the tenons could not be inserted into the mortises made in this last.

In further explanation of joiners'-work, we will briefly describe the mode of making a drawing-board, requiring to be *true*, *plane*, and *square*. Suppose the board is intended to be so wide as to require three boards side by side to make it: these three boards being sawn out of the right length, their edges are first planed perfectly straight and smooth, so that when any two are placed side by side, the edges touching, those edges may touch or fit together accurately for their whole length; this accuracy of joint is obtained by testing the edge after each time the plane is applied, by a straight-edge, or rule, known to be *true*. There are two modes of proceeding to make these joints firm, one by *dowelling*, that is, by inserting short pieces of hard wood, as oak or wainscot, let for half their length into a mortise cut in the edges of the boards that are to fit together; these mortises being, of course, made opposite each other, these dowels prevent the boards from rising up or starting from their places when the work is finished. Instead of short dowels a strip, the whole length of the boards, is let into each joint, half the strip lying in a ploughed groove, made in the middle of the corresponding edges of the two boards. But, besides these precautions, the joints are well glued up.

There are two modes by which this board may be strengthened, to prevent its *warping* or *casting* by the drying or shrinking of the wood. A cross-piece of deal, or better still of wainscot, is fixed across the ends of the boards, these ends being double rebated or *tongued*, to fit into a groove made in the cross-piece to receive the tongue; these cross-pieces prevent the long boards from warping, since the cross-pieces would have no tendency to alter their figure in the direction of their grain.

If, however, the board be larger, *keying* is better than this clamping. Clamping consists in attaching two stout cross-pieces at the back of the boards, the faces of which pieces are worked so as to fit, and are glued into a dovetail-shaped groove cut across the direction of the boards at their back to receive the keys, as will be understood from the annexed sketch.

When the board is made, and the glued joints quite dry, the face is planed perfectly smooth and level, and the edges made truly square, or at right angles; if the board be keyed, the back must be planed smooth before the keys are put in.

The flooring-boards in the better kinds of houses are often *dowelled* in the manner above described, and the ends of the flooring-boards are tongued and grooved to fit together, to prevent the boards from starting up from the joists and becoming uneven.

THE seven days is by far the most permanent division of time, and the most ancient monument of astronomical knowledge; it was used by the Brahmins in India, with the same denomination used by *us*; and was alike found in the calendars of the Jews, Egyptians, Arabs, and Assyrians. It has survived the fall of empires, and has existed among *all* successive generations; a *proof* of the common origin of mankind. The division of the *year* into months, &c., is very old, and almost universal, but not *so ancient* or uniform as the seven days, or week.—MRS. SOMERVILLE.

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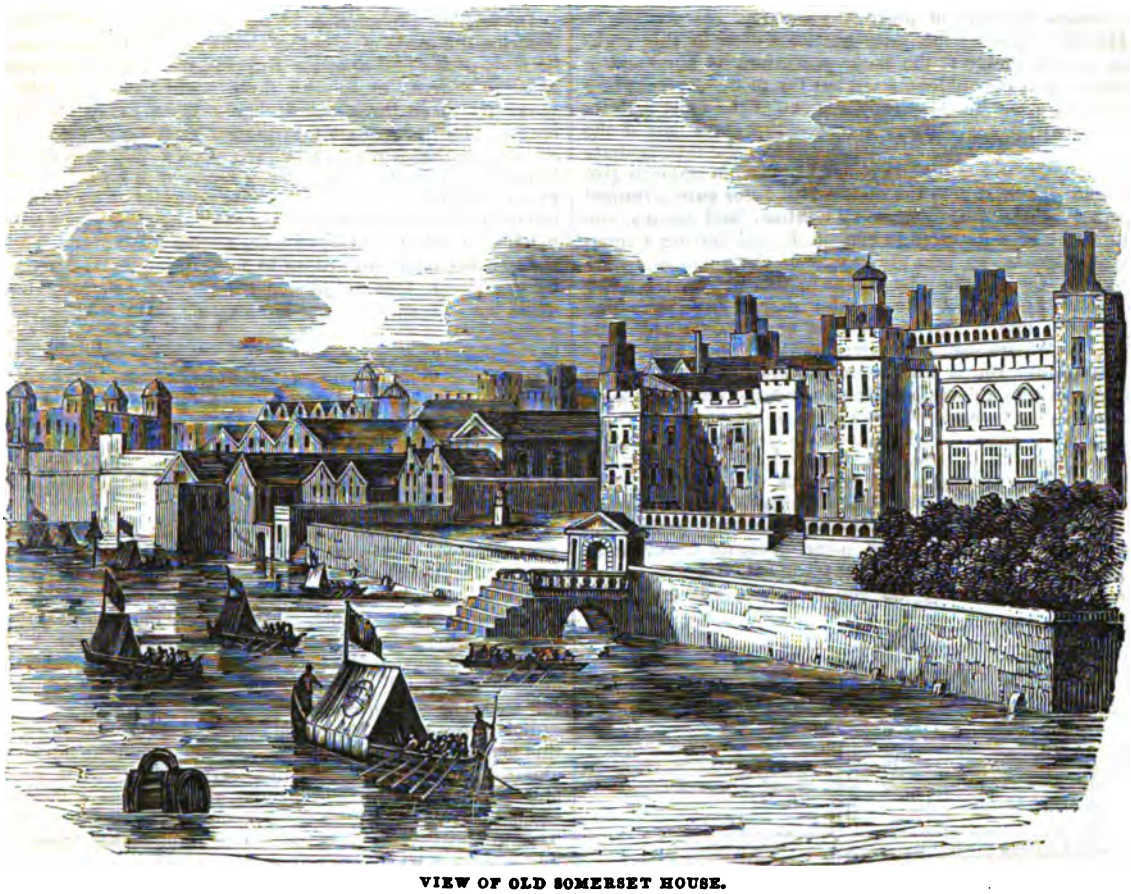
QUEEN ELIZABETH; HER PROGRESSES AND PUBLIC PROCESSIONS. No. VI.



VIEW OF OLD SOMERSET HOUSE.

THE RESIDENCE OF THE PRINCESS ELIZABETH AT HATFIELD—HER AMUSEMENTS WHILE THERE—HER ACCESSION TO THE THRONE AND JOURNEY TO LONDON.

In our last paper on this subject we related the circumstances under which, in the year 1554, the Princess Elizabeth was imprisoned at the royal palace of Woodstock, under the charge of Sir Henry Bedingfield. After a confinement of many months she procured permission to write to the queen, but her importunate keeper intruded and overlooked what she wrote. At length, by the interposition of Mary's husband, King Philip, she was removed to court.

This sudden kindness of Philip, (says Warton,) who thought Elizabeth a much less obnoxious character than his father, Charles the fifth, had conceived her to have been, did not arise from any regular principle of real generosity, but partly from an affectation of popularity; and partly from a refined sentiment of policy, which made him foresee that if Elizabeth was put to death, the next lawful heir would be Mary, Queen of Scots, already betrothed to the dauphin of France, whose succession would for ever join the sceptres of England and France, and consequently crush the growing interests of Spain.

In the course of the first day's journey, which extended from Woodstock to the house of Lord Williams at Ricot, there came on a very violent storm of wind, which two or three times blew off the princess's hood, and the attire of her head. Upon this she begged to retire to a gentleman's house then at hand; but the extreme circumspection of Bedingfield led him to refuse this request, so that the princess was obliged to replace her head-dress under a hedge near the road.

On reaching Hampton Court, where the king and queen were then residing, Elizabeth found that she was still a prisoner. She was visited by Bishop Gardiner and others of the council, who endeavoured to persuade her to make a confesssion of guilt, and submit to the queen's mercy.

One night, when it was late, the princess was unexpectedly summoned and conducted by torch-light to the queen's bed-chamber, where she kneeled down before the queen, declaring herself to be the most faithful and true subject. She even went so far as to request the queen to send her some Catholic treatises which might confirm her faith, and inculcate doctrines different from those which she had been taught in the writings of the reformers. The queen seemed still to suspect her sincerity; but they parted on good terms. During this critical interview Philip had concealed himself behind the tapestry that he might have seasonably interposed to prevent the violence of the queen's passionate temper from proceeding to any extremities.

A week afterwards a change took place in the condition of Elizabeth. She was permitted to retire to Hatfield House, in Hertfordshire, then a royal palace, being placed under the care of Sir Thomas Pope. At parting, the queen presented her with a ring worth

seven hundred crowns; and at the same time recommended to her Sir Thomas Pope as a person whose humanity, prudence, and other qualifications, were calculated to render her new situation perfectly agreeable.

Elizabeth experienced great benefit from this change of keepers; Sir Thomas Pope behaved towards her with kindness and respect, "residing with her at Hatfield rather as an indulgent and affectionate guardian, than as an officious or rigorous governor." That he was also not wanting on proper occasions in showing her such marks of regard and deference as her station and quality demanded, appears from the following anecdote. Two of the fellows of Trinity College, in Oxford, just founded by him, had violated one of its strictest statutes, and were accordingly expelled by the president and society. Upon this they repaired to their founder then at Hatfield with the princess, humbly petitioning to be re-admitted into his college. Sir Thomas was somewhat perplexed; for although disposed to forgiveness, yet he was unwilling to be the first who should openly countenance or pardon an infringement of laws which he himself had made; but perceiving a happy opportunity of adjusting the difficulty, by at the same time paying a compliment to the princess, he with much address referred the matter to her gracious consideration; and she was pleased to order that the offending parties should be restored to their fellowships. Sir Thomas, in his letter to the president of the college, communicating this determination, states, that it was "at the desier or rather commandement of my ladie Elizabeth her grace," that he was content to "remytt this fault, and to dispence with thyem towching the same."

It appears also, that Sir Thomas Pope gratified the princess on some occasions with the characteristic amusements of the times, and that he did so both at his own expense and at the hasard of offending the queen,—as we learn from the following passage of an old chronicle:—

In Shrovetide, 1556, Sir Thomas Pope made for the ladie Elizabeth, all at his oune costes, a greate and rich maskinge, in the greate halle at Hatfelde; wher the pageaunts were marvellously furnished. There were ther twelve minstrels antickly disguised; with forty-six or more gentlemen and ladies, many of them knights or nobles, and ladies, apparelled in crimsin sattin, embrothered uppon with wrethes of golde, and garnished with bordures of hanging perle. And the devise of a castell of clothe of golde, sett with pomegranates about the battlements, with shields of knights hanging therefrom, and six knights in rich harneis turneyed. At night the cuppboard in the halle was of twelve stages, mainlie furnished with garnish of gold and silver vessul, and a baseket of seventie dishes, and after a voidee of spices and suttleties,* with thirty spyse plates, all at the chardgis of Sir Thomas Pope. And the next day the play of Holophernes. But the queen percase mysliked these folliries, as by her letters to Sir Thomas Pope hit did appear, and so their disguisinges were ceased.

On some occasions, however, the princess was allowed to make excursions, either for pleasure or for the purpose of paying her compliments at court. It is related that on the 25th of February, 1557,—

The lady Elizabeth came riding from her house at Hatfield to London, attended with a great company of lords, and nobles, and gentlemen, unto her place called Somerset-place, beyond Strand-bridge, to do her duty to the queen. And on the twenty-eighth she repaired unto her grace at Whitehall, with many lords and ladies. (And again, one day in March, the same year,) aforenoon, the lady Elizabeth's grace took her horse and rode to her palace of Shene, with many lords, knights, ladies, and gentlemen, and a goodlie company of horse.

In April, the same year, she was escorted from Hatfield to Enfield-Chase, by a retinue of twelve ladies clothed in white satin, on "ambling palfries," and twenty yeomen in green, "all on horseback, that her grace might hunt the hart." On entering the chase or forest she was met by fifty archers in scarlet boots and yellow caps, armed with gilded bows, one of whom presented her with a silver-headed arrow winged with peacocks' feathers. Sir Thomas Pope had the *devising* of this show; at the conclusion of which, the princess was gratified with the privilege of "cutting the throat of a buck." In the same month, likewise, she was visited at Hatfield by the queen, when the great chamber was adorned with a sumptuous suit of tapestry, called the *hangings of the siege of Antioch*, and after supper a play was performed by the choir-boys of St. Paul's.

In the summer of this year, the princess paid a visit to the queen at Richmond. She went by water from Somerset-place, in the queen's barge, which was richly hung with garlands of artificial flowers, and covered with a canopy of green sarcenet, wrought with branches of eglantine on embroidery, and powdered with blossoms of gold. She was accompanied by Sir Thomas Pope and four ladies of her chamber. Six boats attended on this procession filled with her highness's retinue, habited in russet damask and blue embroidered satin, lapelled and spangled with silver, with bonnets of cloth of silver, plumed with green feathers. She was received by the queen in a sumptuous pavilion made in the form of a castle, with cloth of gold and purple velvet, in the labyrinth of the gardens. The walls or sides of the pavilion were chequered into compartments, in each of which was alternately, a lily in silver, and a pomegranate *in* gold. Here the party were entertained at a royal banquet, in which was introduced "a sottletie of a pomegranate tree," bearing the arms of Spain. There were many minstrels but there was no masking or dancing. In the evening the princess with all her suite returned as she had come, to Somerset-place; and the next day went back to Hatfield.

During the period of her residence at Hatfield, the Princess Elizabeth was also present at a royal Christmas, kept with great solemnity by Philip and Mary at Hampton Court. On Christmas eve the great hall of the palace was illuminated with a thousand lamps, curiously disposed. The princess supped at the same table in the hall with the king and queen, next the cloth of state; and after supper, was served with a perfumed napkin and plates of confects by the Lord Paget; but she retired to her ladies before the revels, maskings, and disguisings began. On St. Stephen's day she heard mattins in the queen's closet, adjoining to the chapel, where she was attired in a robe of white satin, strung all over with large pearls. On the 29th day of December she sate with their majesties and the nobility at a grand spectacle of jousting, when two hundred spears were broken, half of the combatants being accoutred in the "Almaine" and half in the Spanish fashion. All these particulars, which are minutely recorded by a chronicler of the day, are considered by Warton, the biographer of Sir Thomas Pope, as affording a vindication of Queen Mary's character in the treatment of her sister, and as proving that the princess, during her residence at Hatfield, lived in splendour and affluence, that she was often admitted to the diversions of the court, and "that her situation was by no means a state of imprisonment and oppression, as it has been represented by most of our historians."

It has been mentioned above, that Sir Thomas Pope, during his attendance on the princess, was engaged in founding Trinity College, at Oxford. An undertaking of such a nature could not fail to attract the attention of Elizabeth, whose learned education

* Curious devices in cookery or confectionary.

naturally interested her in the progress of a work so beneficial to the advancement of learning. It appears from a letter written by Sir Thomas Pope, that the new college often formed a subject of conversation between him and his illustrious charge.

The princess Elizabeth, her grace, whom I serve here, often askyth me about the course I have devysed for my scollers: and that part of myne estatutes respectinge studie I have shewn to her, which she likes well. She is not only gracious but most learned, as ye right well know.

Elizabeth resided at Hatfield during the rest of Mary's reign; she spent there four years, which, as Warton observes, were by far the most agreeable part of her time during that turbulent period; for, although she must have been often disquieted with many secret fears and apprehensions, yet she was here perfectly at liberty, and treated with a regard due to her birth and expectations. In the mean time, to prevent suspicions, she prudently declined interfering in any sort of business, and abandoned herself entirely to books and amusements. The pleasures of solitude and retirement were now become habitual to her mind, and she principally employed herself in playing on the lute or virginals, embroidering with gold and silver, reading Greek, and translating Italian. She was now continuing to profess that character which her brother Edward gave her, when he used to call her his *sweet sister Temperance!* But she was soon happily removed to a reign of unparalleled magnificence and prosperity.

Queen Mary died on the 17th of November, 1558, about eleven or twelve o'clock. Soon afterwards the lady Elizabeth was proclaimed queen by divers heralds of arms, trumpets sounding, and many of the chief nobility present, as the Duke of Norfolk the Lord Treasurer, the Earls of Shrewsbury and Bedford; also the Lord Mayor and his brethren the Aldermen, with many others. In the afternoon the bells in all the churches of London were rung in token of joy, and at night bonfires were made, and stalls set out in the streets, "where was plentiful eating and drinking, and making merry." The next day, being Friday, a fasting day, there were no public rejoicings, but on the Saturday, *Te Deum Laudamus* was sung and said in the churches of the metropolis. "Thus," says Strype, "the satisfaction generally conceived by the people for this new queen, superseded all outward appearances of sorrow for the loss of the old one."

Elizabeth was at Hatfield when her sister died, and she remained there for some days afterwards. On the 23rd of November she removed to London, attended by "a thousand or more of lords, knights, gentlemen, ladies, and gentlewomen;" at Highgate she was met by the Lord Mayor, Aldermen, and Sheriffs, who conducted her to the Charter-house, then the residence of Lord North.

In which removing and coming thus to the citie, it might well appeare how comfortable hir presence was to them that went to receive hir in the waie, and likewise to the great multitudes of people that came abroad to see hir grace, shewing their rejoicing harts in countenance and words, with heartie prayers for her Majesties prosperous estate and preservation; which no doubt were acceptable to God, as by the sequel of things it may certenlie be believed.

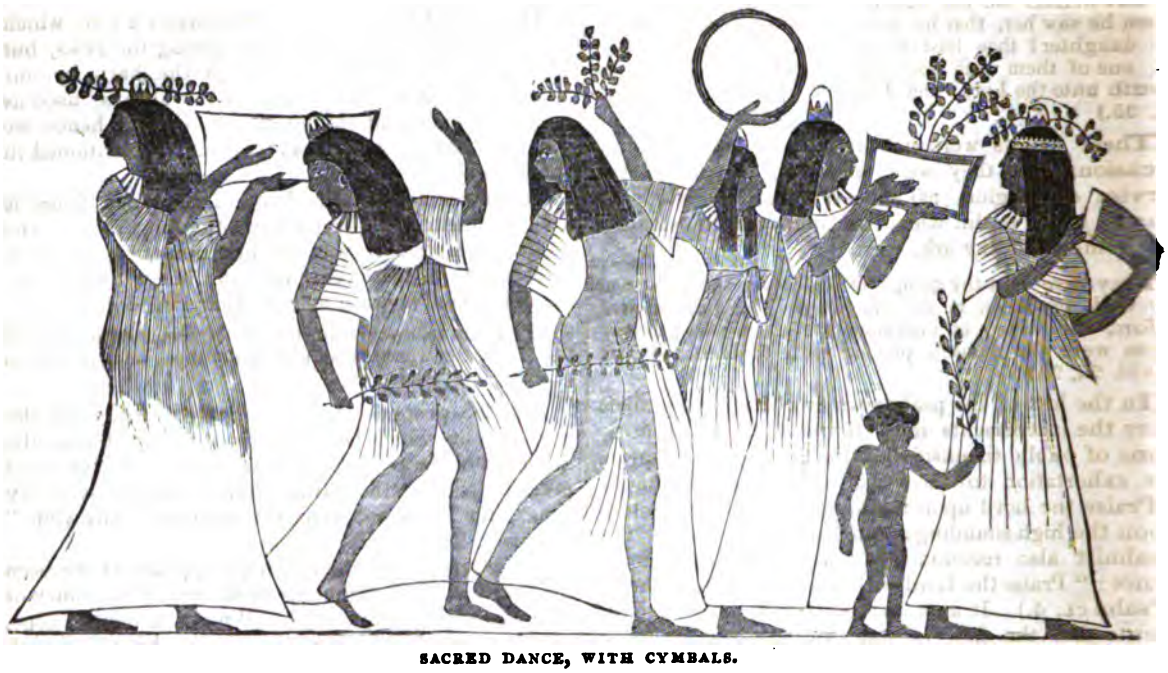
The Queen remained at the Charter-house until the 28th, when she removed to the Tower. All the streets through which she had to pass were new gravelled. "She rode through Barbican, and, entering the citie at Cripplegate, kept along the wall as far as Bishopsgate, when she turned off to Leaden Hall, passed through Gracechurch Street and Fenchurch Street, and turning down Mark Lane, into Tower Street, reached the Tower." Before her rode many gentlemen, knights, and nobles,—then the trumpeters,—then all the heralds in array, "my Lord Mayor, holding the Queen's sceptre, riding with garter," and Lord Pembroke bearing the Queen's sword. Then came her grace on horseback, apparelled in purple velvet, with a scarf about her neck; the serjeants of arms being about her person. Immediately after the Queen rode Sir Robert Dudley, (afterwards Earl of Leicester,) who was her Master of the Horse; and then the guard with halberds. There was "great shooting of guns," the artillery in the Tower firing continually for almost half an hour; so that "the like was never heard before." In certain places stood children, who made speeches to her as she passed; and in other places was "singing and playing with regals." Thus, "with great joie and presse of people, of whom all the streets were full as she passed, declaring their inward rejoisings by gesture, words, and countenance," the Queen entered the Tower.

At the Tower Queen Elizabeth remained until the 5th of December, when she removed a little nearer to Westminster,—namely, to the Strand House, or Somerset House, "going by water, and shooting the bridge, trumpets sounding, much melody accompanying, and universal expressions of joy among the people." On the 23rd she went to the palace at Westminster, where she kept her Christmas, and resided for some time.

The 15th of January had been appointed for her Majesty's coronation; and we are told that in Christmas week, "scaffolds began to be made in divers places of the city for pageants against the day the Queen was to pass through to her coronation, and the conduits to be new painted and beautified." On the 12th of January the Queen removed from Westminster to the Tower,—a change preparatory to her passage through the city. She went by water, and was attended by the Lord Mayor and Aldermen in their barge, and all the citizens, "with their barges decked and trimmed with targets and banners of their mysteries." "The bacheller's barge of the Lord Maior's companie, to wit, the mercers, had their barge with a foist trimmed with three tops, and artillery aboord, gallantlie appointed to wait upon them, shooting off lustily as they went, with great and pleasant melodie of instruments, which plaied in most sweet and heavenlie manner." Her grace shot the bridge "about two of the clocke in the afternoon, at the still of the ebbe;" and landed at the privy stairs at the Tower wharf.

Our engraving presents a view of old Somerset House, such as in all probability it appeared from the water in the reign of Elizabeth. This structure was erected in the reign of Edward VI., by his uncle, the protector Somerset, who very unscrupulously demolished several buildings, some of them ecclesiastical, as well to make way for his new palace as to provide materials for the same. The architect of the edifice is supposed to have been John of Padua, the "deviser" of buildings to Henry VIII.; and it furnished one of the earliest specimens of the Italian style in this country. It passed to the crown upon the attainder of the protector; and doubts have been expressed whether Somerset was not beheaded before its completion. Great alterations were made in this palace by Inigo Jones, in the reign of James I., in order to fit it for the reception of Prince Charles and his bride, Henrietta Maria of France. Our engraving, however, shows the building as it appeared before those alterations. In the river is introduced part of a royal procession on the Thames, from authorities referring to the reign of James I., and, in all probability equally applicable to that of Elizabeth.

ILLUSTRATIONS OF THE BIBLE FROM THE MONUMENTS OF ANTIQUITY. No. XIV.



SACRED DANCE, WITH CYMBALS.

TRIUMPH OF THE ISRAELITES IN THEIR DELIVERANCE.

After the children of Israel had been so signally delivered from imminent ruin, by the destruction of proud Pharaoh and his host in the Red Sea, Moses composed a hymn of triumph, which may be regarded as the earliest specimen of the sublime poetry of the Hebrews. A more literal version of this noble hymn than that given in the authorized translation, will probably be acceptable to our readers:—

I will sing unto Jehovah because he hath been gloriously exalted;
The horse and his rider he hath hurled into the sea.
My strength and song is Jah, and he shall be to me for salvation;
He is my God, and I will make him a dwelling;
The God of my fathers, and I will exalt him.
Jehovah is mighty in war; Jehovah is his name.
The chariots of Pharaoh and his hosts he hath cast into the sea;
His chosen charioteers are sank in the sea of weeds*:
Depths have covered them: they sank to the dark recesses like a stone.
Thy right hand, O Jehovah, hath been glorified in power:
Thy right hand, O Jehovah, hath dashed the enemy in pieces.
And in the greatness of thy Majesty, thou hast thrown down those rising against thee.
Thou sentest forth thy burning: it consumed them like stubble;
And by the breath of thy nostrils the waters were heaped together.
The floods erected themselves as a heap:
The depths were congealed in the heart of the sea.
The enemy said,—I will pursue:—I will overtake:—
I will divide spoil: my soul shall be satiated upon them.
I will draw my sword: my hand shall repossess them
Thou didst blow with thy wind: the sea hid them.
They sank as lead in the mighty waters.
Who is like unto thee among the gods, O Jehovah?
Who is like unto thee,—glorious in holiness,—
Exalted in power,—doing wonders?
Thou didst stretch forth thy right hand: the earth swallowed them.
Thou hast led forth in thy mercy the people which thou hast redeemed.
Thou hast guided them in thy strength to the dwelling of thy holiness.
Nations shall hear and tremble greatly,
Terror shall seize the dwellers in Palestine;
Then the leaders of Edom shall be alarmed:
The mighty of Moab—them shall a shuddering possess.
All those dwelling in Canaan shall melt away;
Upon them shall fall fear and terror:
By the might of thy arm they shall be still as a stone,
Until thy people pass over, O Jehovah!
Until thy people pass over, which thou hast purchased.
Thou shalt bring them and plant them in the mountain of thine inheritance,
The place for thy rest, which thou, Jehovah, hast made;
The sanctuary, O Lord, thy hands have established.
Jehovah shall reign for ever and ever.
For the horse of Pharaoh went with his rider and his chariots into the sea,
And the sons of Israel walked on dry land in the midst of the floods.

* Yam Suph, that is, "the Sea of Weeds," is still the oriental name of the Red Sea

This magnificent hymn appears to have been immediately adopted as a national anthem; the initial letters of the Hebrew words in the line

Who among the gods is like unto thee, O Jehovah?

were inscribed on the standards of the Maccabees, and, indeed, gave them their name. The moment it was uttered, the Jewish maidens sang the hymn of triumph, with all the joy and exultation which so wondrous a deliverance naturally inspired.

Miriam the propheteess, the sister of Aaron, took a timbrel in her hand; and all the women went out after her with timbrels and with dances. And Miriam answered them, Sing ye to the Lord, for he hath triumphed gloriously; the horse and his rider hath he thrown into the sea. (Exodus xv. 20, 21.)

The engraving at the head of this paper, taken from the Egyptian monuments, shows us that the triumphal processions were generally formed by damsels, who danced in solemn measure, and accompanied themselves on the timbrels and cymbals. This was also the custom among the Israelites. Thus when Jephthah won such a signal victory over the Ammonites, and rashly vowed that he would sacrifice to the Lord "whatever came first out of the doors of his house," his daughter presented herself, in her anxiety to head the choir of damsels who assembled to celebrate her father's victory.

And Jephthah came to Mizpeh unto his house, and,

behold, his daughter came out to meet him with timbrels and with dances: and she was his only child; beside her he had neither son nor daughter. And it came to pass, when he saw her, that he rent his clothes, and said, Alas, my daughter! thou hast brought me very low, and thou art one of them that trouble me: for I have opened my mouth unto the Lord, and I cannot go back. (Judges xi. 34, 35.)

These dances were not only customary on festive occasions, but they were also consecrated to the service of religion, as appears from the words of David, in the psalm which he composed to celebrate the removal of the ark.

They have seen thy goings, O God; even the goings of my God, my King, in the sanctuary. The singers went before, the players on instruments followed after; among them were the damsels playing with timbrels. (Psalm LXVIII. 24, 25.)

In the last of the psalms we find that the cymbals were the instruments most frequently used on occasions of public thanksgiving, for the Psalmist repeats his exhortation to their use with great emphasis: "Praise the Lord upon the loud cymbals, praise him upon the high sounding cymbals." (Psalm CL. 5.) The Psalmist also recommends the use of the sacred dance: "Praise the Lord with the timbrel and dance." (Psalm CL. 4.) It appears from the Egyptian monuments that the dancers and cymbal-players were of a lower rank than other musicians, and hence it was that when Michal, the daughter of Saul, saw King David "dancing before the Lord," in the triumphal procession which escorted the ark of the covenant unto Jerusalem, "she despised him in her heart." (2 Samuel vi. 16.)

The stringed instruments used by the ancient Egyptians differed very little, if at all, from those which we find mentioned in the Old Testament. The most remarkable of them are represented in the following engraving. The figure to the right bears a portable harp, which is without a fore-piece; but the harps used by male performers, and by females when they were stationary, had very large fore-pieces, rising to the height of about one-third of the instrument, and fancifully carved. The performers played them both sitting and standing; and the music was so highly valued, that it was believed capable of dispelling cares, and even curing mental diseases. When Saul was visited by an evil spirit after disobeying the Divine command, we find his servants recommending him to seek out a skilful harper, and particularly pointing out David, whose attainments in music were celebrated even in his early youth.

And it came to pass, when the evil spirit from God was upon Saul that David took an harp, and played with his hand: so Saul was refreshed, and was well, and the evil spirit departed from him. (1 Sam. xvi. 23.)

The second figure to the right carries a lyre, which was also a favourite instrument among the Jews, but which has been confounded with the harp by our translators; it was generally, if not always, used as an accompaniment to vocal music, and hence we find the harp, or lyre, so constantly mentioned in the psalms.

The instrument in the hand of the third figure is a viol, which was played with the fingers like the modern guitar. It was an instrument particularly used upon festive occasions, and hence Isaiah, denouncing God's wrath against Babylon, declares,—

Thy pomp is brought down to the grave, and the noise of thy viols: the worm is spread under thee, and the worms cover thee. (Isaiah xiv. 11.)

And the prophet Amos, similarly proclaiming the punishments which God was about to inflict upon the kingdom of Israel, connects the viols with the vocal music:—"Take thou away from me the noise of thy songs, for I will not hear the melody of thy viols." (Amos v. 23.)

The trumpet and the reed-pipe appear to have been the only wind instruments with which the ancient Egyptians were acquainted. We see a double pipe, of very simple construction, borne by the fourth figure in our engraving, but we cannot determine the number of holes with which it was perforated. This instrument was chiefly used on joyous occasions; for it is particularly recorded, that when Solomon was proclaimed, "The people piped with pipes, and rejoiced with great joy, so that the earth rent with the sound of them." (1 Kings i. 40.) It appears, from a passage in the New Testament, that pipes were commonly used by children in their sports, for our Lord compares the froward generation of the Jews to children, who would not dance when their companions piped for them. (Matt. xi. 16, 17.)

The next figure carries a harp, or psaltery, of singular construction, on her shoulder. This instrument was only valuable as an accompaniment, for we find no example of it in the hands of an isolated performer.

The last of the musical train is keeping time with her hands, a custom which seems to have prevailed in almost every nation.

It is improbable that the Israelites, on their departure from Egypt, could have brought with them all the musical instruments necessary for a perfect concert; indeed, the timbrels alone are mentioned: but in later ages, especially in the reign of David, the national hymns of thanksgiving were accompanied

CHOIR OF FEMALE MUSICIANS.

by the music of a greater variety of instruments than we have described.

It deserves to be remarked, that the cymbals which were so highly valued in the earlier part of the Jewish history, seem to have fallen into contempt after the Roman invasion; for St. Paul compares the worthlessness of a man, destitute of charity, to "sounding brass or a tinkling cymbal." (1 Cor. xiii. 1.) But while the Jewish kingdom flourished in its integrity, cymbals were so highly valued, that they were always introduced into public worship; for we are told of Hezekiah, that,—

He set the Levites in the house of the Lord with cymbals, with psalteries, and with harps, according to the commandment of David, and of Gad the king's seer, and Nathan the prophet: for so was the commandment of the Lord by his prophets. (2 Chron. xxix. 25.)

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT.

No. V.

ON THE CUSTOMARY USE OF GLASSES.

In young persons, long-sightedness is occasioned by the flatness of the crystalline lens, and may be remedied by employing a convex lens, which prevents the convergency of the rays beyond the retina, which otherwise occurs, by which vision is indistinct, for a reason the very opposite to that by which short sight is produced.

The powers of the eye are so influenced by the employments to which it is habitually subjected, that we must, in many cases, refer acuteness or dimness of vision to the exercises fitted or unfitted to the function of the optic structure. The short or the long-sighted eye, provided the organism of the parts be healthy, have their comparative want of adaptive power remedied, as we have seen by the assistance of a concave or convex lens; but no single lens will confer on the landsman the perfect adjusting power to great distances of the seaman, to whose eye the speck on the extreme horizon, often invisible to the unaccustomed eye, appears in all the detail of a well-appointed vessel, the number of whose guns, her flag, her masts, &c., are accurately detailed, while, on the other hand, the same long sight is inadequate to the detail of near and minute objects, which the short-sighted eye appreciates so well. But, however wise and beneficent is the principle which gradually adapts an organ to its accustomed employments, provided they are not at variance with its legitimate use, the same principle fails to explain the great superiority in vision of some individuals, among the lower animals as well as in man, over others. The eagle and other birds of prey possess remarkably acute vision for near as well as distant objects: soaring high in the air, so as to command an extensive range of prospect, they have the power, it is said, of pushing out the cornea to increase its convexity, and so include a wider range of vision; but it is probable that this superior vision, ascribed to a more complete and comprehensive power of adaptation, which theory only assumes, and experience does not confirm, ought rather to be ascribed to a superior sensibility of the retina, since anatomy shows that the optic nerve in such animals is not only large, but ramified in a complete manner, such as is not found in man.

Let us now suppose that a healthy eye is constantly employed in looking through optical glasses, such as watchmakers, engravers, naval officers, philosophical instrument-makers, astronomers, &c., the adjusting powers of the eye are being constantly taxed, that is, the crystalline lens is brought nearer to the pupil than in its natural state it ought to be. The ciliary apparatus and that belonging to the iris is overworked, and hence arises derangement of the functions of the different parts. Extreme caution requires to be exercised in the use of these instruments; the eye should be allowed long intervals of repose, and much will depend on the state of the individual's health generally. Above all things, we caution our young readers to beware of adopting that silly bauble, a quizzing-glass; for, even to short-sighted persons its operation is bad, since it contributes to render the adjusting powers of the two eyes unequal; and if the healthy eye persist in its use, a few years will suffice to bring the floating muscæ to the eye which so needlessly employs the glass, as a prelude to disorders of a more serious kind.

It is a point of much importance in the choice of spectacles, that the substance of the glass should be free from opaque impurities, and its surface from scratches or indentations, because the existence of either of those irregularities necessarily occasions an unequal action of light upon the retina. Let us illustrate this by an extreme case. Suppose an individual were constantly to wear spectacles, and that when one of the glasses had a black spot, an eighth of an inch diameter near the centre, the retina at one particular spot spherically opposite to the opaque spot on the glass, would be deprived of the direct rays usually impingent upon it, and would only receive those coming by oblique directions; the consequence of which would be, that the retina would be unequally acted upon, and so far from being benefited by that spot being less excited, it would produce those unnatural effects, which always accompany the partial exercise of an organ to the exclusion of another part, which is generally an inflammation of the line of separation between the active and the inert portions. This being the case in an extreme instance, we may expect effects somewhat analogous, but slighter, when the irregularity is smaller, independent of the dimness which is given to the images of objects on the retina.

Spectacles should always be chosen less powerful than is necessary for absolutely distinct vision, or the eye gets wearied and distressed by the use of them, and what is perhaps as bad, the disease is increased by the violence of the intended cure. The writer, speaking from experience, recommends near-sighted individuals to be content with vision a *little* obscured, and to be thankful that science affords the means of attaining even that imperfect degree of visual perception.

In concluding this article we may remark that our object has not been to excite alarm by contributing to the fears of the many, the employment of whose eyes furnishes them with daily bread. The several trades and professions that we have named, and from which many of our illustrations have been taken, may, we are convinced, be exercised with impunity, provided the exercise be attended with caution. Cleanliness, bodily exercise, and temperance, are the main safeguards which will not fail to prevent the evils we have cited, or to mitigate their action if they have already begun.

Those who have obtained the farthest insight into nature have been in all ages firm believers in God.—WHEWELL.

No object is more pleasing to the eye, than the sight of a man whom you have obliged; nor any music so agreeable to the ear, as the voice of one that owns you for his benefactor

CORONATION ANECDOTES.

No. I.

William the Conqueror.

William was very anxious that his conquest of England should at least appear to be sanctioned by the consent of the people, and he therefore gave orders that his new subjects should be invited to witness the ceremony of his coronation, on Christmas day, 1066. Stigand, archbishop of Canterbury, refused to perform the ceremony, as some assert, because he looked upon the Norman prince as an intruder; but Langtoft* informs us that Stigand was at the time suspended by the pope. The passage in Langtoft is curious:

Fair grace William fond; his chance fulle wele him satte
The reame of Inglond so graciously he gatte.
The archbishop Stigand, of Inglond primate
That tyme was suspended, the pope reft him the state.
The abbot & priour, men of religion
The oder men of honoure, archdeane & person
Wer prived of thar office, of woulfes had renoun
For lechorie that vice wer many als don doun.
The archbishope of York com with devocioun,
Thorgh William praiere, com to London toun,
Bifor the barons brouht, he gaf William the coroun
To chalange was he nouht, Sir Stigand was don doun.

After William had taken the coronation oath, to protect the church, prohibit oppression, and execute judgment in mercy, Aldred put the question, "Will ye have this prince to be your king?" the people answered with loud shouts, and the noise gave so much alarm to the Norman garrison in the city, that the soldiers believing the English to have revolted, without waiting to make any investigation, immediately set the next houses on fire, which spreading and giving a general alarm, most of the congregation rushed out of the church, the English hastening to stop the fire, and the Normans to plunder. The bishops, clergy, and monks, who remained within the church, were in such confusion, that they were scarcely able to go through the office of crowning the king: William himself, who saw the tumult, and could not conjecture its cause, sat trembling at the foot of the altar, and though no great mischief was done by the fire, it laid the foundation of a long and inveterate enmity between the English and the Normans.

Matilda, William's queen, was crowned eighteen months afterwards, by the same archbishop of York.

William II., Rufus.

William II. laid claim to the crown by virtue of a form of election; the nobles believing that he would be less inclined to control their usurped privileges than his elder brother, Robert. He was crowned at Westminster, September 27th, 1087, by Lanfranc, archbishop of Canterbury, and the archbishop of York; eight other bishops, and many of the chief nobility, assisted at the ceremony. Besides swearing to observe justice, equity, and mercy, in all his conduct, and to maintain the peace, liberties, and privileges of the church, he promised that he would follow the archbishop's counsels in all his administrations, and, as Fabian says, "he was well eyded of Lamfrank whyle he lyved, for he was dyvers and unstable of manners, so that atwene hym & his lordes was often dyssension." Langtoft specially mentions the ring in this coronation:

To William the rede kyng is gyven the coroun,
In Westmynstere tok he ryng in the abbay of Londoun.

Henry I.

The coronation of Henry I. was performed in a hurried manner, on the fourth day after the death of Rufus, by Maurice, bishop of London, the archbishop of Canterbury being out of the country. In every respect the forms of his coronation were the same as those of the Saxon kings. But it appears from Langtoft, that he was crowned a second time, by Anselm, archbishop of Canterbury, after his marriage with Matilda, niece of Edgar Atheling, of the ancient Saxon line, or, as Langtoft calls her, "kyng & sire," that is, a sovereign in her own right.

Henry wedded dame Molde that kyng was & sire;
Saint Anselme, men tolde, corouned him and hire
The corounyng of Henry & of Molde that may*
At London was solemply on St. Martin's day.

He afterwards married Adeliza of Lorraine, and had her crowned with the usual solemnities.

Stephen.

The coronation of Stephen, after he had sworn allegiance to the empress Matilda, was viewed with great anxiety, in an age when it was supposed that the punishment of perjury was immediate and visible. The ceremony was performed by William, archbishop of Canterbury; and it is said that a dreadful storm arose, which threw all the parties into such confusion, that the consecrated wafer fell on the ground, the kiss of peace after the sacrament was omitted, and even the final benediction forgotten. It was also remarked, that the archbishop, and the false witnesses who declared that Henry I. disinherited his daughter a little before his death, met a speedy and miserable end. In consequence, probably, of these disasters, Stephen was compelled to swear a new oath to the barons at Oxford, which is thus described by Langtoft:

Bot sen dis courounyng till Oxenford he fore,
Ther Steven the king bifor the clergie swore
That if a bishopriche vacant wer the se
The kyng, ne non of his, suld chalage that of fe.
With wrong no with right, of non that from him cam
So help him God Alle myght, and that halidame[b]
A nother oth not lesse the clergie did him karke[c],
That wodes ne foreste, withouten palaised parke,
The common folk suld quems ou[d], & other in fere,
The kyng no man suld deme[e] in court for wild dere
Clerk[f] ne lewed[g] man for no wilde beste
For common the folk it wan[h] wod open and forest.
The third poynt thei wild[i] to swere he was dryven
That the Danegeld for ever suld be forgyven
And of ilk[k] a hide two schillynges that he toke
Suld never eft betide, he swore that on the boke.

The three clauses of this oath are singularly characteristic of the age; the necessity for the first clause arose from the custom of keeping sees vacant, and applying their revenues to the use of the crown until a new bishop was chosen, and it is also connected with the question of lay investitures, which at that time convulsed Christendom. In the second clause we find that the forest-laws, so rigidly enforced by the Norman kings, were a serious grievance; indeed, all the old historians agree that the worst feature in the administration of Henry I. was the severity with which he punished those who took venison in the royal forests, cut down wood, or committed any waste therein, and under pretence of such trespasses he had heavily fined several gentlemen who had the reputation of being wealthy. *Danegeld* was the name of the tax imposed by the Saxon kings to defray the expense of the armaments necessary to defend the coast of England against the Danes; its continuance under the Normans, who were themselves of Danish descent, was felt to be an insulting and galling badge of slavery.

* Langtoft, an Augustin friar, who about the commencement of the fourteenth century wrote a chronicle of England in verse.

[a] Maiden. [b] The Virgin Mary. [c] Charge.
[d] Take pleasure on. [e] Doom, judge. [f] Clergyman.
[g] Layman. [h] Procured. [i] Required. [k] Each.

HENRY II.

Henry, called Fitz-Empress, from his mother, and Court-Mantel, from his having introduced the fashion of short cloaks into England, was crowned at Westminster on the Sunday before Christmas day, A. D. 1154, being the Romish feast of St. Ligerius, by Theobald, archbishop of Canterbury. Although his hereditary right was unquestionable, he was formally elected by the clergy and people; they testified their assent by loud acclamations, and Langtoft insinuates that his subjects were more anxious to have him for a king than he was to acquire a kingdom:

To London thei him brought with grete solempnitie
The popille him besouht ther kyng for to be
The day of St. Liger was Henry corouned king
Thebald of Canterber gaf him the coroune and the ryng.
This Henry was Mald[a] sonne, the erle wif of Anjowe
The Emperice was wonne[b] and right heyre for to trowe[c]
For Henry dochter & his heyre thorgh sight[d],
Now comes hir sonne in pas, Henry hir heyr thorgh right.

It is said that Henry was crowned again with his queen, A. D. 1159, but Mr. Arthur Taylor plausibly conjectures that this report arose from his having worn the crown during the ceremony. Indeed it was usual for the English kings to have a kind of minor coronation performed at the great festivals, but this was terminated, A. D. 1159, when Henry and his queen, spending the Easter holidays at Worcester, entered the offertory in solemn procession, placed their crowns upon the high altar, and vowed never to wear them again during their lives.

Early in the year 1170, King Henry adopted what was in England a very unusual measure, and which was manifestly pregnant with danger; he proposed to his parliament to have his son Henry crowned titular king. Gervase of Canterbury insinuates that some of the nobles were unwilling to comply with this proposal, but that they feared to oppose the king's pleasure, lest he should bring them to trial for various malversations and outrages during Henry's absence in Normandy. The young prince was knighted by his father on the morning of the 14th of June, being the second Sunday after Trinity, and the same day was crowned by Roger, archbishop of York, assisted by the bishops of Durham, London, Salisbury, and Rochester, in the abbey church of Wesminster. William, king of Scotland, his brother David, and a greater number of nobles and prelates than had ever assembled at a like solemnity, performed fealty and homage to the young king on the following day, with a limitation, "saving the fealty due to their lord the king, his father."

On this occasion Henry did not exhibit his usual prudence, but seems to have been guided by passion rather than policy. The ceremony of the coronation was performed by the archbishop of York, without any protestation to save the rights of the see of Canterbury, and the prince's wife, daughter to the king of France, was not crowned with him, according to the usual practice when the king has a consort. The former of these circumstances was an intentional insult to the archbishop of Canterbury, Thomas à Becket, then in the midst of his fierce contest with the king, and every precaution had been taken to make the injury more flagrant. The king, immediately after the death of archbishop Theobald, got a bull from the pope, allowing him to have his son crowned by whatever prelate he pleased; but Becket contended, and probably with truth, that this licence was obtained to prevent the archbishop of York from pretending to consecrate the new king, as matter of right, in case the see of Canterbury should be vacant. Roger, archbishop of York, also obtained a bull, granting him the privilege of crowning the king of England, as some of his predecessors had done, and of having his cross carried erect before him through all the kingdom. The latter privilege was restricted, however, to the archiepiscopal province of York by a subsequent bull, and Becket's partisans maintained that the former had been tacitly subjected to a similar limitation. Roger, however, was a privileged person; he was the papal legate for Scotland, and therefore exempt from Becket's legatine jurisdiction, and consequently he was the fittest prelate to consecrate the youthful sovereign.

The apparent slight to the princess Margaret arose solely from the necessity of keeping the exact time of the coronation secret, and thus frustrating the machinations of Becket. As soon as the ceremony was completed, the king sent orders to provide a suitable equipage for Margaret with all the ornaments necessary to the state of a queen. Becket's conduct proves the importance of this secrecy; he had sent inhibitions to the archbishop of York and all the English bishops, forbidding them to officiate at the coronation, and had procured bulls from the pope to the like effect, which, however, the papal messengers were afraid to carry into England. Roger, bishop of Worcester, undertook to convey the papal inhibitions to the English parliament, but he was stopped at Dieppe by Richard du Hommet, justiciary of Normandy, and an embargo laid on all the shipping in the harbour, until the coronation was over.

At the coronation feast, Henry with his own hand served up a dish at the prince's table, but the arrogant boy, instead of feeling grateful for the unusual honour conferred upon him, said to the archbishop of York, who complimented him upon it, "Assuredly it is not a great condescension for the son of an earl to wait on the son of a king." Prince Henry was crowned a second time, in company with his wife Margaret, at Winchester, A.D. 1172, by the archbishop of Rouen assisted by the bishops of Evreux and Worcester. The see of Canterbury was then vacant, and the king of France, for whose gratification the ceremony was performed, insisted that neither the archbishop of York, nor the bishops of London or Salisbury, should officiate at the coronation.

[a] Matilda's. Believed to be the rightful heir.
[b] Found.
[c] Manifestly.

ON THE LOSS OF A BELOVED OBJECT.

THE voice which I did more esteem
Than music in her sweetest key;
Those eyes which unto me did seem
More comfortable than the day;
Those now by me, as they have been,
Shall never more be heard, or seen;
But what I once enjoyed in them,
Shall seem hereafter as a dream.

All earthly comforts vanish thus;
So little hold of them have we,
That we from them, or they from us,
May in a moment ravished be.
Yet we are neither just nor wise,
If present mercies we despise;
Or mind not how there may be made
A thankful use of what we had.—WITHER.

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THE WYE AND MONMOUTHSHIRE. No. I.

RHAYADYR BRIDGE.

How "delightsome" are the associations connected with the Wye! yet how few amongst the great mass who have the means of making an annual excursion in search of health or recreation, are acquainted with it except by name. It shall be our object to give a full and popular illustration of this romantic river, in a short series of papers, with such notices of the remarkable antiquities and highly-interesting country through which it passes, within reach of the tourist, as may tend to render the subject complete. We trust that we shall thus diffuse information amongst the body of our readers, which many of them may be able to turn some day to pleasant account.

Our opening remarks may be widely extended. Notwithstanding all the advantages of cheap travelling and steam-boats, how slight is the acquaintance of the majority of our countrymen of the middle, and often of the higher, classes, with the wonders of nature and art that abound in their native land. To our mind the first duty of a man who possesses the means of travelling, should be to make a minute acquaintance with his own country. Comparatively few amongst us are thoroughly acquainted with England,—Wales, that stronghold of the picturesque, although very easily accessible, is trodden but by a few,—Scotland, our northern hill-country, with its wild and romantic shores and groups of islands, is still, except by hearsay, as little known to many Englishmen as Polynesia,—and Ireland, though rich in natural beauty of the highest class, is an absolute *terra incognita*; we have, however, undertaken the agreeable task of supplying information on these subjects, and we refer to our papers on Ireland, and other places, with peculiar satisfaction.

It has been well remarked by an ingenious writer, in contrasting the scenery of Great Britain with that on the continent of Europe, that magnitude is not essential to beauty, and that sublimity is not always to be measured by yards and feet. A mountain may be loftier, or a lake longer and wider, without any gain to that picturesque effect which mainly depends on form, combination, and colouring. In the peculiar nature of its scenery, too, England may be said to stand alone.

> Corn-waving fields, and pasture green, and slope
> And swell alternate; summits crowned with leaf,
> Grove encircled mansions,—the church, the farm, the mill,
> And tinkling rivulet,—

distinguish even the most uninteresting districts, which sometimes make up for their deficiency in the higher order of natural beauty, by more striking events in their history, or by monastic or castellated remains of a more attractive character. Nor must

we lose sight of local and national attachment, which cast an indescribable charm over all. So much for the "picturesque" or topographical side of the subject. Our limits will not permit us to attempt even a bare enumeration of the wonders of art, which have elevated this country to the highest rank amongst nations, else we could dwell at length on the field presented to the traveller in search of information,—on the manufacturing and commercial establishments, the dockyards and arsenals, ports, mines, canals, bridges, railroads, and other public works, which contribute to our prosperity, and are eminently calculated to instruct the inquiring mind.

Having thus slightly glanced at the profitable nature of *home tours*, let us proceed to our immediate subject, and request the reader to accompany us to the source of the "sylvan Wye."

PART I.

PLINLYMMON—SOURCE OF THE WYE—LLANGURIG —RHAYADYR.

THOU sylvan Wye, since last my feet
Wandered along thy margin sweet,
I've gazed on many a far-famed stream,—
* * * *
But none, to my delighted eye,
Seemed lovelier than my own sweet Wye,
Through meads of living verdure driven,
'Twixt hills that seem earth's links to heaven;
With sweetest odours breathing round,
With every woodland glory crowned,
And skies of such cerulean hue,
A veil of such transparent blue,
That God's own eye seems gazing through.

THE "pleased Vaga," as the Wye is poetically termed by Pope, takes its rise from a spacious hollow near the summit of Plynlimmon, a dreary mountain which attains an altitude of 2463 feet, on the borders of the counties of Cardigan and Montgomery, about fifteen miles from that fashionable watering-place, Aberystwith. The lower parts of the mountain are covered with soft mossy turf, and stunted heath, but often broken with rugged and extensive bogs, which render the ascent dangerous and difficult*. In other places the surface is entirely overspread with large loose stones, or white-coloured rocks, which give it a singular appearance on approaching its base. The summit consists of two peaks, on each of which are piled a pyramid of loose stones, called in the language of the country, *Carnedd*, or *Carneddau*. Similar heaps of stones are common on the neighbouring mountains, and in many other places in Wales. It has been supposed that they are sepulchral monuments erected by the Britons in honour of their military heroes, but it seems more probable that those on Plynlimmon were formerly used as beacons, as they might have been seen from ten counties. In 1401, the renowned chieftain, Owen Glendower, posted himself on this mountain with a small body of men, awaiting the arrival of his vassals and friends from various parts of the principality, and from whence he frequently descended and harassed the adjacent country. The entrenchments he threw up may still be traced. The blade of a British spear or pike made of brass, was found in a bog near this spot some years ago. The views from the summit in clear weather embrace a wild and extensive range of landscape; exhibiting mountains rolling, as it were, over each other in the most sublime forms and beautiful hues. In the north appears Cader Idris, and the lofty region of Snowdonia; the hills of Salop and Hereford may be seen to the east and north-east; and on the west the bay of Cardigan, and a dim outline of the coast of Ireland. After a copious fall of rain, the cataracts which descend with headlong fury down the sides of the mountain, add considerably to the grandeur and wildness of the scenery. This "hill king" of Cambria is best known, however, as the parent of no less than five streams or rivers, whence is derived the name *Pum*, five, and *Luinon*, springs, or fountain. The most important of these is the Severn, which rising in the north-east of the same group of mountains, (for Plynlimmon consists properly of three mountains piled together into one gigantic mass,) after a course of about two hundred miles, pours its waters into the sea below Bristol. The WYE, or *Gwy*, which in Celtic signifies a river, issuing from the southern side of the mountain, falls in a narrow streamlet several hundred yards nearly perpendicular, till gradually increasing by the union of several small springs, the overplus of the surrounding morasses, it soon forms a cataract, rolling with amazing rapidity over a rocky channel. The other rivers, the Rheidal, the Llyffnant, and the Fynach, though considerable streams, are of minor importance.

The WYE, (says Gilpin,) after dividing the counties of Radnor and Brecon, passes through the middle of Herefordshire; it then becomes a second boundary between the counties of Monmouth and Gloucester, and falls into the Severn a little below Chepstow. The exquisite beauty and grandeur of the scenery which in many parts adorn its shores in almost endless variety, is scarcely to be equalled. Such is the sinuosity of its course, that between Ross and Chepstow, a distance not exceeding seventeen miles in a direct line, the water passage is thirty-eight. Along the whole of this distance, the poet Gray truly observes, that its banks are a succession of nameless beauties.

The beauty of these scenes arises chiefly from two circumstances; the *lofty banks* of the river, and its mazy course; both of which are accurately embodied by the poet†, when he describes the Wye as *echoing* through its *winding* bounds. It could not well *echo*, unless its banks were both *lofty* and *winding*‡.

Let us now commence our matter-of-fact tour. The progress of the Wye from its source to LLANGURIG, a distance of about ten miles, is through a naked and dreary country, with undulating hills in the background. Mr. Roscoe observes, in his delightful *Wanderings*, that the village is honoured in all travellers' note-books with the cognomen of "wretched." There is only one very indifferent house of entertainment, but now that there is a prospect of the *Upper Wye Tour* becoming appreciated as it ought, we agree with Mr. Roscoe that Llangurig will no doubt at an early period afford superior accommodation. Poor as the village is, the scenery is wild and extremely magnificent, so much so, indeed, that Nicholson speaks of it as "exceeding the powers of description." The hamlet stands on the north bank of the river, surrounded by towering mountains, the lower portions of which are partially covered with wood, and relieve the hitherto monotonous tone of the landscape, the eye having previously been accustomed to dwell chiefly on the sullen and savage sterility of Plynlimmon.

The scenery from Llangurig to Rhayadyr, especially on approaching the latter, is highly interesting; the river being confined by close rocky banks, and having a considerable declination, the whole is a succession of rapids and waterfalls. The Nanerth rocks, for nearly three miles, form a fine screen to the north bank. The trees and shrubs which overhang the eddying pools and rapids in many places, add considerably to the picturesque character of the scenery.

RHAYADYR, a straggling, but rather a curious specimen of a Welsh town, has little to recommend

* At a small roadside inn at Eisteddfa Gurrig, a guide can be obtained, and from whence the mountain is generally ascended.

† Pope. ‡ GILPIN'S *Observations on the river Wye.*

it, save its beautiful situation. It stands on elevated ground on the east bank of the Wye, which, after leaving the Nanerth rocks, makes an easy bend under woody hills. The view from the bridge, which has a very fine arch, is singularly grand, the river here falling over a ledge of rugged rocks and forming a magnificent cascade, from which the town derives its name Rhayadyr Gwy; *Rhayadyr*, signifying a cataract, and *Gwy*, a river. There is excellent fishing above Rhayadyr, the river abounding with fine trout, and in the Summer season it is much resorted to by the lovers of the piscatory art. The town is divided into four streets, intersecting each other at right angles, a plan common in most of the old Welsh towns. In the reign of Henry the Eighth, the quarter sessions were held here, but were soon afterwards removed, chiefly on account of the inability of the place to afford necessary accommodation for the judges. In the centre of the town stands the hall, a square building erected about 1768. The castle, which stood on a nook of the Wye, at the extremity of Maes-bach, a small common in the neighbourhood, was anciently of considerable importance. Of the superstructure nothing now remains. It is said to have been erected by Rhys, prince of South Wales in the time of Richard the First, and afterwards burnt in 1231 by Llewellyn ap Jorwerth.

CHAPTERS ON CORONATIONS.

No. II.

THE REGALIA.

Among the Regalia of England there is no article possessing more historical interest than King Edward's or, as it is commonly called, St. Edward's Chair, in which the sovereign is seated when the crown is placed upon his head. It is in shape similar to the high-backed chairs which were fashionable in England about a century ago; its height is six feet seven inches, its depth twenty-five inches, and the breadth of the seat measured withinside is twenty-eight inches. At the height of nine inches from the ground there is a ledge which supports the celebrated Stone of Destiny, which Edward I., or Longshanks, brought from Scotland as a memorial of his conquest of that country. This stone was originally the royal seat of the kings of Ireland; they called it *Liafail*, or "the stone of destiny," and attributed so much importance to it, that they named the island in honour of it, Innisfail, or "the island of destiny." According to the monkish legends, this was the identical stone which served Jacob as a pillow when he saw the miraculous vision in Bethel; they tell us that it was brought by Gathol, king of the Scuths, or Scots, to Brigantia, a city of Gallicia in Spain, and that it was removed from thence to Ireland by Simon Brech, the leader of a body of Scots, about seven hundred years before the birth of Christ. From these invaders Ireland received the name of Scotia, which it retained until within a century of the English invasion. Fergus, a descendant of Simon Brech, being compelled to leave Ireland in consequence of civil wars, led a body of emigrants to Argyleshire, and brought with him the stone of destiny, which he deposited at Dunstaffnage, about three hundred years before the birth of Christ. All his descendants were installed on this stone seat, and it was believed that when the rightful heir took his seat, the stone emitted loud and harmonious musical sounds, but that it remained silent whenever a pretender attempted to be crowned.

The real history of the stone is scarcely less curious than that ascribed to it in the legend. We learn from sacred history that the earliest altars were made of unhewn stone: indeed, the Chaldee word for altar, signifies literally, "stones orderly erected," and God himself directs Moses, "If thou wilt make me an altar of stone, thou shalt not build it of hewn stone: for if thou lift up thy tool upon it thou hast polluted it." (Exod. xx. 25.) This reverence for unhewn stones led to their being used as idols. We read of the children of Israel in the age of their corruption, that "they set them up images and groves in every high hill and under every green tree." (2 Kings xvii. 10.) Here the Hebrew word *Matzebah*, which our translators have rendered "image," properly signifies "a stone pillar." So also in the Levitical law: "Ye shall make you no idols nor graven image, neither rear you up a standing image, neither shall ye set up any image of stone in your land to bow down before it: for I am the Lord your God." (Levit. xxvi. 1.) Here the word *Matzebah*, rendered "standing image," signifies simply a stone pillar. In consequence of these perversions, the erection of the Matzebah was entirely prohibited, when Moses recapitulated the law to the children of Israel.

The worship of stone pillars was very common in the East; Clement of Alexandria declares that rude stones were the object of adoration in those lands where the art of statuary was not understood; Pausanius mentions several such pillars in Bœotia, where they were probably introduced by the Phœnician colonists; and Arnobius declares that the pagans of Northern Africa consecrated pillars of stone for idols so late as the fourth century of the Christian era.

Superstition connected stone seats with the administration of justice, which was regarded as a right delegated to rulers by the gods. This custom lasted to a very late period; a marble bench anciently stood at the upper end of Wesminster Hall, where the king in person, and at a subsequent period his chief judges, heard the pleas of those who complained of injury, and hence the chief criminal court of the realm is now called the Court of King's Bench.

The Irish stone of destiny appears from the ancient records of Ireland to have been an altar, an idol, and the throne of the kings; and it was therefore viewed with three-fold reverence. A remarkable prophecy identified its fortunes with those of the royal line of the Scots, which is thus given in the old monkish rhymes:—

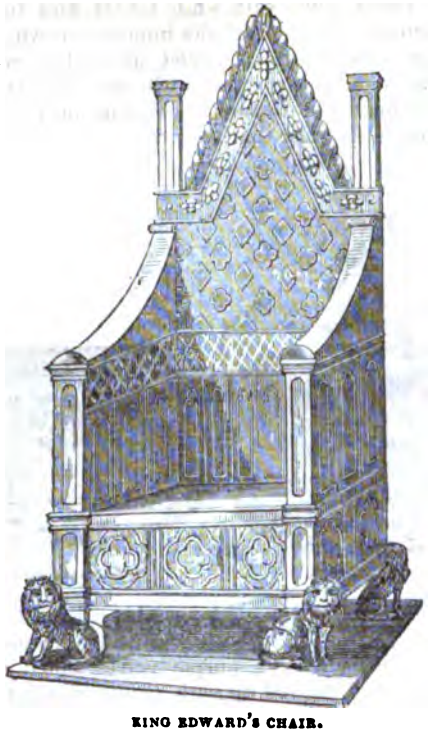
Ni fallat fatum,
Scoti, quocunque locatum
Invenient lapidem,
Tenentur regnare ibidem.

That is:

Or Fate is false, or where this stone is found,
A king of Scottish race will there be crowned.

It was on account of the importance attached to this prophecy that Kenneth removed the stone from Dunstaffnage to Scone, where, for more than four hundred and fifty years, it was used as a throne at the coronation of the Scottish kings. Its removal to England was felt by the entire people of Scotland as a national humiliation, and they stipulated for its restoration at the treaty of Northampton, A.D. 1328. Writs for sending it back were issued by Edward the Third, but from some unexplained cause they were never executed.

When James the First ascended the throne of England great importance was attached to this fulfilment of the prophecy connected with the stone of destiny, and so deep was the impression thus produced on the minds of the Scottish people, that in the reign of Queen Anne it reconciled many to the Union, who would otherwise have opposed that measure.



KING EDWARD'S CHAIR.

A close examination of the stone induces us to believe that it is a block of red sandstone, containing a more than ordinary proportion of ferruginous matter; it certainly is not an aërolite, as several authors have asserted. Its dimensions are, twenty-two inches in length, thirteen in breadth, and eleven in depth. At each end are two short iron chains.

The chair itself was anciently decorated with carving, gilding, and painting, but its beauty has been long since effaced. At modern coronations it is covered with cloth of gold, but we could wish that the decorations of this very interesting relic of antiquity should be restored as nearly as possible according to the ancient pattern.

The AMPULLA, or Golden Eagle, in which the holy oil for anointing the kings is preserved, is a vessel of pure gold, in the shape of an eagle with expanding wings, nearly seven inches in height, and weighing about ten ounces. The old historian Walsingham, in his account of the coronation of Henry the Fourth, connects the use of this Ampulla with a very singular legend:—Henry the Fourth, according to the historian, was anointed with the identical holy oil which the blessed Virgin gave to St. Thomas the Martyr, archbishop of Canterbury: that is, to Thomas à Becket, whose extreme pride and insolence form so remarkable a part of the history of Henry the Second. Becket received this extraordinary boon when he was in exile, and the Virgin assured him, that whatever kings of England should be anointed with this oil, they would become merciful rulers and distinguished champions of the church. It may be curious to remark, that Walsingham, or, as he is more frequently called, "the worthy monk of St. Alban's," is not very scrupulous respecting the purity of the language he attributes to the Virgin, for the word which we have rendered "champions," literally signifies boxers, or heroes of the prize-ring,—a kind of champions not very well suited to the defence of the church.

This oil, preserved in a golden eagle and stone jar, was long lost, but it was at last miraculously brought to light. While Henry, the first duke of Lancaster, was waging war in foreign parts, the aforesaid eagle

THE AMPULLA.

and jar were delivered to him by a holy man, to whom the place of its concealment was divinely revealed. He gave it to the most noble Prince Edward, commonly called the Black Prince, who deposited it in the Tower of London. It was enclosed in a box secured with more than ordinary care; but the box itself by some accident was put astray, so that the holy oil could not be used at the coronation of Richard the Second. In the year of grace 1399, Richard the Second, having made an inquisition into the treasures bequeathed to him by his ancestors, found the eagle and jar, together with a manuscript in the handwriting of "St. Thomas of Canterbury," containing the prophetic description of all the advantages and blessings that the kings of England would derive from being anointed with this holy oil. He was so struck with the enumeration, that he wished the ceremony of his coronation to be repeated, and applied to the archbishop of Canterbury for the purpose. The prelate obstinately refused, declaring that unction was a sacrament, which, like the sacrament of baptism, could not be administered a second time. Richard took the eagle and jar with him when he made his unfortunate voyage to Ireland, and on his return resigned them to the custody of the archbishop of Canterbury at Chester, saying, "It is manifestly the will of God that I should not be anointed with this holy oil; that solemn sacrament is reserved for some more favoured monarch." The archbishop kept these precious treasures until the usurpation of Henry the Fourth, who was the first English sovereign anointed with this precious oil.

The legend of the Ampulla used at the coronation of the French kings is still more extraordinary. It is said to have been brought from heaven by a dove to St. Remy, when he was performing the ceremony of the coronation of Clovis. Hincmar, in his life of St. Remy, thus narrates the legend:—

> And behold a dove, fairer than snow, suddenly brought down a phial in his mouth full of holy oil. All that were present were delighted with the fragrancy of it, and when the archbishop had received it, the dove vanished.

Another historian, quoted by Menin, is rather more particular in his relation:—

> When he that bore the chrism was absent and kept off by the people, lo! suddenly no other doubtless than the Holy Spirit appeared, in the visible form of a dove, who carrying the holy oil in his shining bill, laid it down between the hands of the minister.

The oil of this mystic vessel was declared by the Romish priests to be undiminished by use, and this was gravely put forward as a standing miracle until the time of the French Revolution. At the coronation of Charles the Tenth, the priests had the folly to proclaim in the public papers that a phial containing some of this invaluable unction had been preserved from the destruction of the rest of the Regalia, to anoint the head of a monarch so devoted to the interests of the Romish church.

The original Ampulla given to Thomas à Becket

was not destroyed with the rest of the Regalia in the time of the Commonwealth; but it was renovated for the coronation of Charles the Second, and at the same time a new spoon was prepared into which the oil is poured by the consecrating prelate. The spoon, like the eagle, is of chased gold, and is adorned with four large pearls in the broadest part of the handle.

Kings were anciently anointed on the head, the bowings of the arms, on both shoulders, between the shoulders, on the breast, and on the hands. There are only three distinct anointings in modern coronations, on the head, breast, and hands, which were said by Becket to indicate glory, holiness, and fortitude. Great importance was attached to this unction, for Shakspeare represents Richard the Second declaring on the invasion of Bolingbroke:

> Not all the water in the rough rude sea,
> Can wash the balm from an anointed king.

The rich IMPERIAL CROWN of gold with which the monarchs of England are crowned, is still called St. Edward's crown, though it was actually made for the coronation of Charles the Second, the more ancient crown having been stolen and sold in 1642. It is embellished with pearls and precious stones, as diamonds, rubies, emeralds, and sapphires, and has a mound of gold on the top, enriched with a fillet of gold embellished also with precious stones. Upon the mound is a cross of gold garnished with jewels, and three very large oval pearls, one fixed on the top, and two others pendent on the ends of the cross. It is composed of four crosses pattée, and as many

ST. EDWARD'S CROWN.

CROWN OF STATE.

fleurs de lis of gold, all embellished with precious stones. From these crosses arise four circular bars or arches, which meet at the top in form of a cross; having at their intersection a pedestal, on which is fixed the mound already mentioned. The cap within this crown is of purple velvet, lined with white taffeta, and turned up with ermine. On the day of coronation the jewels and precious stones belonging to the Crown of State, so called because it is worn by every sovereign coming in state to parliament, are taken out, fixed in collets, and pinned into the imperial crown: their places are supplied by mock stones, when the ceremony of the coronation is concluded.

Since the time of Charles the Second a very rich crown of state, to be worn by the sovereign only at the coronation dinner in Westminster Hall, is prepared for every succeeding king or sovereign queen. This is very rich, being embellished with several large diamonds, and a great number of pearls; but it is most distinguished by a very large ruby, set in the middle of one of the four crosses, and estimated at the value of ten thousand pounds, and also by the mound's being one entire stone of a sea-green colour, known by the name of an aquamarine. The cap is of purple velvet, lined with white taffeta, and turned up with ermine, like that of the imperial crown.

A queen-consort wears a circlet proceeding to her coronation, and is crowned with ST. EDGITHA'S CROWN; which is so named in honour of Edgitha, the consort of Edward the Confessor.

QUEEN'S CROWN

QUEEN'S CIRCLET.

The queen's circlet of gold is richly adorned with large diamonds, and has a string of pearls round its upper edge. The cap is purple velvet, lined with white taffeta, and turned up with ermine richly powdered.

The queen's crown, or the crown of St. Edgitha, was originally manufactured for Catherine, the consort of Charles the Second. It is a rich imperial crown of gold, set with very valuable diamonds, intermixed with other precious stones and pearls. It is composed of crosses and fleurs de lis, with bars and arches, and a mound and cross on the top, like the crown of St. Edward, only smaller and lighter. The cap is of purple velvet, and turned up with

QUEEN EDGITHA'S CROWN.

ermine, or minever pure, richly powdered. The crown of St. Edward is used solely for the coronation of a sovereign queen, and cannot be worn by a queen consort.

The Saxon kings of England wore crowns like those of other nations, which were at first only simple circlets of gold. King Egbert first adorned the fillet, or circle, with radiant points, similar to the crowns worn by the emperors of the East; and King Edmund, surnamed Ironside, tipped the points with pearl. William the Conqueror surmounted the circle with points and leaves, the points being much higher than the leaves, and each of them was tipped with three pearls; on the top of the cap, or tiara, was a cross pattée. William Rufus adorned his crown with points only, which were all tipped with pearls. The crown of Henry the First was adorned with fleurs de lis only; these fleurs de lis appear to have been originally designed to represent the heads

of lances, and to have been borrowed from some military decorations of the ancient Germans. Maud, Queen of England, enriched her crown with leaves and points alternately, the leaves being higher than the points; and this custom remained unvaried until the accession of Edward the Third. He enriched his crown with fleurs de lis and crosses pattée. Edward the Fourth was the first English monarch who wore a close or arched crown; it was decorated with fleurs de lis and crosses pattée, and arched with four bars. Henry the Seventh and Henry the Eighth had their crowns composed of fleurs de lis and crosses pattée, with two arches, embellished with pearls and precious stones; and this form has been since continued.

The ancient French crown was a circle of gold enamelled, of eight fleurs de lis, encompassed with eight arched diadems, bearing at the top a double fleur de lis, which is the crest of cognizance of France.

The Spanish crown was a circle of gold, richly decorated with jewels and precious stones, and adorned with eight leaves. It was not closed with arches until the marriage of Philip the Second with Queen Mary of England, when four arches were added, being double the number of those in the English crown. Those of Bohemia, Poland, Denmark, and Sweden, are similar to the Spanish; but no foreign crown has the velvet tiara or the ermine of the English crown.

The crown of Hungary, worn by the emperors of Austria, is double: the lower crown is similar to the Spanish; the upper is composed of sixteen plates of gold, from which two arches arise, having in the centre a cross, richly decorated at the extremities with pearls. The sixteen plates are enamelled with busts of Jesus Christ, the evangelists, and the apostles; so also is the flat part of the arches, the whole being enriched with pearls, diamonds and precious stones.

Before concluding this part of the subject, it may be as well to describe the crowns or coronets worn by the princes of the blood and the English nobility. The crown of the Prince of Wales, when there is an heir apparent to the throne of Britain, is a circle of gold, surrounded with four crosses pattée and as many fleurs de lis, set alternately. From the two centre crosses an arch arises, adorned with pearls, and surmounted by a ball and cross: within the coronet is a cap of crimson velvet, lined with white sarcenet, and turned up with ermine. The Prince of Wales has also another distinguishing ornament, *viz.*, a simple coronet, surmounted with a plume of three ostrich feathers, and having the motto, "*Ich Dien*," that is, "I serve." This cognizance was first assumed by Edward, Prince of Wales, commonly called the Black Prince, after the battle of Crecy, A.D. 1346, where, having killed John, king of Bohemia, he took from his head such a plume, and put it upon his own.

The CORONET of the Princes of the Blood-royal is composed of a circle of gold, richly chased, having on the edge two crosses pattée, two strawberry-leaves, and four fleurs de lis. Within the coronet is a crimson velvet cap, lined with sarcenet, and turned up with ermine. On the top of the cap there is a rich tassel of gold and spangles.

The coronet of a Duke is a circle of gold, richly chased, having on the edge eight strawberry-leaves, which most probably were originally lance-heads, all of equal height; within is a crimson velvet cap, topped by a gold tassel, and turned up with ermine of one row. The coronet of a Marquis is a circle of gold, set round with four strawberry-leaves, and as many pearls, on pyramidal points of equal height, alternately. The cap is the same as that of the duke. An Earl's coronet has eight pyramidal points, with as many large pearls on the tops of them, placed alternately with as many strawberry-leaves, lower than the pearls. The cap and tassel are the same as before. Coronets were first assigned to earls in the reign of Henry the Third. The Viscount has only pearls, without any limited number, placed on the circle itself all round. The cap and tassel are the same as before. Coronets were first assigned to viscounts in the reign of James the First. The coronet of a Baron has only six pearls set round the circle, at equal distances; before the reign of Charles the Second barons wore simply a crimson cap, turned up with white fur, but that monarch assigned them coronets, and at the same time issued warrants permitting the peers of Scotland and Ireland to use coronets similar to those worn by noblemen of the same rank in England.

MATERIALISM.

THE doctrine of the *materialists* was always, even in my youth, a cold, heavy, dull, and insupportable doctrine to me, and necessarily tending to atheism. When I heard with disgust, in the dissecting rooms, the plan of the physiologist, of the gradual secretion of matter, and its becoming endued with irritability, ripening into sensibility, and acquiring such organs as were necessary, by its own inherent forces, and at last rising into intellectual existence, a walk into the green fields, or woods, by the banks of rivers, brought back my feelings from nature to God. I saw in all the powers of matter, the instruments of the Deity: the sunbeams, the breath of the zephyr, awakened animation in forms prepared by Divine Intelligence *to* receive it; the insensate seed, the slumbering egg, which were to be vivified, appeared like the new-born animal, works of a divine mind; I saw *love* as the creative principle in the material world, and this love only as a divine attribute. Then, in my own mind, I felt connected with new sensations and indefinite hopes, a thirst for immortality; the great names *of* other ages, and of distant nations, appeared to me to be still living around me; and even in the funeral monuments of the heroic and the great, I saw, as it were, the indestructibility of mind.

These feelings, though generally considered as poetical, offer a sound philosophical argument in favour of the immortality of the soul. In all the habits and *instincts* of young animals, their feelings or movements may be traced in intimate relation to their improved perfect state; their sports have always affinities to their modes of hunting or catching their food, and young birds even in the nest show marks of fondness, which, when their frames are developed, become signs of actions necessary to the reproduction *and* preservation of the species. The desire of glory, of honour, of immortal fame, and of constant knowledge, so usual in young persons of well-constituted minds, cannot, I think, be other than symptoms of the infinite and progressive nature of intellect—hopes, which, as they cannot be gratified here, belong to a frame of mind suited to a nobler state *of* existence.—SIR HUMPHRY DAVY.

The proper study of mankind is man.—POPE.

IF the proper study of mankind is man, it is proper only *so* far as it may conduce to our own advancement in righteousness, by making us acquainted with that weakness and corruption of our nature, which self-love is for ever labouring to conceal. Should we forget to apply to our own individual cases, the observations which we make in the case of others, our knowledge will not only be barren of improvement, but may even serve to engender a censorious spirit; and increase that pride and presumption which *we* know too frequently attends the mere possession of speculative knowledge. Our own personal improvement is the centre towards which all reflections upon the nature and actions of man should converge; and whatsoever tends to unfold and bring to light any weakness lurking in the heart, should be received on our parts with all the readiness and impartiality which becomes creatures who are conscious of their responsible condition, and of that higher *and* eternal destiny which is to succeed this probationary life! —J. S. M. ANDERSON.

RUNJEET SINGH,

CHIEF OF LAHORE.

If the revolutions of barbarians have neither the importance nor the historical relations of civilized countries, they are at least more frequent, and their perpetrators as blood-thirsty. When man has thrown aside the ties of religion and morality which bind him to society, he exhibits, in an awful manner, the horrors of unrestrained passion; and, whether he be savage or civilized, his motives for action are the same, as well as their consequences.

Ambition and the lust of power prompt men to rebel: they unite under the guidance of some one powerful mind, the possessor of which sways the rebels to his own will, and by them serves his own purposes. Such a man is Runjeet Singh, the present Chief of Lahore, whose history is altogether extraordinary, as well as that of the individual who mainly contributed to place that Indian chief in his present powerful position. The facts which we are about to detail are we believe quite new to English readers: they are obtained from the French newspapers of a few years back, and their authenticity is probably unquestionable.

In the extensive continent of Asia, towards the thirtieth degree of North latitude, and between British India and Persia, there is a country, concerning which little is known, although it is extensive, rich, and has a large and industrious population. The form of this country is that of a delta, by the junction of the rivers Indus and Sutledge: the north of this country is bounded by part of the Himalayah mountains; the population is warlike and enterprising, and the country is called the kingdom of Lahore.

About forty years ago Lahore had no existence as a kingdom. A number of petty princes, who lived by pillage and rapine, but independent of each other, divided among themselves the provinces of this beautiful country. They were constantly engaged in mutual war, and conquering and being conquered in quick succession, the peaceful arts could find neither introduction nor encouragement amid the horrors of this rude warfare. This rich country, therefore, situated so admirably between two great empires, in the centre of a vast continent, with numerous navigable streams, and natural frontiers, was torn with internal dissensions, and incapable of assuming any political importance, for want of some tie which would unite its discordant elements; for want, in fact, of a chief, or even of a usurper, who could conquer the whole of the country, and govern it when conquered.

At the present time this country has a chief, who has blended into one kingdom all the dissentient states which formerly composed it. This country is now a kingdom with about twenty millions of inhabitants: it has a considerable and well-disciplined army, numerous founderies and arsenals, a regular government, finances in a flourishing state, and its importance is such that it is the friend and ally of the British government in India.*

This kingdom owes its origin and its present state of wealth and power chiefly to two of those extraordinary men who from time to time appear among the scenes of human affairs, and so materially influence the condition of mankind. One of these men is Runjeet Singh, King of Lahore and Cachmire, the conqueror of all the petty sovereign princes who formerly harassed the whole country between the Indus and the Sutledge; the other is a Frenchman, Allard by name, one of the officers of the old imperial army of Napoleon, and at the present time commander-in-chief of the military forces of Runjeet Singh.

About two years ago General Allard visited his native country, bringing with him his wife, a native of Lahore, and his children, for the purpose of placing the latter under proper tutors, so as to be educated in the religion of their fathers, and according to the customs of civilized Europe. While at Paris the general had an interview with the editor of the *Journal des Débats*, and communicated to him the following particulars:—

General Allard is about fifty years old, of the middle size, of a handsome figure: the expression of his face is mild but dignified; his language is short and precise, his voice agreeably modulated, his discourse modest. He wears a long white beard and mustachios. His hair is gray, but his whole external appearance indicates the vigour of a mature age: his eyes are bright and piercing: he is devoted to the military profession, and seems formed for command.

General Allard was formerly attached to the staff of Marshal Brune. He quitted France at the downfall of Napoleon, with the intention of going to the United States of America, and had already paid for his passage on board one of the frigates of the Union, when he met with an Italian officer, who, like himself, was about to seek his fortune in a foreign clime, and was induced by the Italian to give up his American trip, and go into Egypt. He did so; and met with but a cold reception from the Pacha, and no employment. He then went into Persia, and at Ispahan he was heartily welcomed by the Abbas-Mirza, who conferred upon him the title of colonel, and treated him as such: he promised him the command of a regiment, but failed in his promise. Fortunately for Allard there was at the court of Ispahan an old king of Cabul, whose brother had usurped his throne and deprived him of his sight: this king, an experienced old man, told Allard that in Cabul he would be sure of welcome and employment. Cabul is situated between Persia and the principality of Cachmire. Allard went there, and found in fact that there was a king who could well appreciate the services of an European officer. But scarcely was Allard established in Cabul, when he learnt that there dwelt, two hundred leagues further on, a skilful and bold chief, who was employing all his energies and resources in founding a kingdom. This was the kind of chief that Allard desired to serve: he went therefore to Lahore, and found Runjeet Singh, who was then a rajah. Allard met with welcome and employment from the rajah, whose confidence he soon obtained: he placed under Allard a few men, who, being disciplined according to the military system of France, became the nucleus of the rajah's future army. Next, Allard disciplined a hundred men, who were thus instructed in the duties of military officers. Then he organized a regiment; then a brigade; then a division; his reputation increasing with the number of his soldiers, and the confidence of the rajah keeping pace with the growth of his army. This army soon became the terror of the neighbouring princes, who disputed with Runjeet Singh the sovereignty of the kingdom of Lahore: they were all in succession beseiged in their fortresses, attacked in their retreats, beaten in open field, or vanquished in the defiles and fastnesses of their mountains. At length none resisted; and at the end of a few years Runjeet Singh was the only king of this country. It was the triumph of discipline over the rude warfare of the barbarian, and

* See Malte-Brun's *Universal Geography*, vol. iii., p. 52.

Allard was loaded with honours and with wealth: he had a palace at Lahore, a crowd of servants and slaves, and a regiment for his escort. He married a princess, a relation of the king, and was finally named commander-in-chief of the armies of the kingdom: he became, next to Runjeet Singh, the most important, powerful, and absolute personage in this extensive country. Such is the fortune of General Allard.

After an absence of sixteen years, Allard wished to revisit his country. His wife did not accompany him to Paris: she remained at Saint Tropez, a sea-port of the Mediterranean, on the coast of France. This lady was shocked at French customs and manners: she thought it highly indelicate that French women should allow their faces to remain uncovered, and constantly expressed a strong desire to return to her native country.

The condition of the women in Lahore is nearly the same as in Mohammedan countries generally. They are brought up in an entire ignorance of all kinds of useful knowledge: most of them do not even know the use of the needle. They live in an absolute seclusion, and never see the sky, but from the flat roofs of their houses; or, when they ride out, through the open tops of their palanquins, which are enclosed on all sides; so that, as General Allard says, they never see the horizon. They pass their time at the toilette, arranging their black hair, and adorning their persons: they tinge their hands and feet with a red dye. Within doors they wear no covering for the feet: their slippers are made of silk, embroidered with gold; these they leave at the door of the apartment, which is covered with the richest carpets in the world.

The children receive no mental instruction: they learn neither reading nor writing. Their knowledge of good and evil is left to natural instinct. This system probably explains why it is that Lahore is overrun with robbers and bandits. At eight years of age the boys are taught to ride on horseback, to guide an elephant, and to fire the musket; and in a few more years they are excellent recruits for General Allard.

Runjeet Singh is not more learned than his subjects; he does not value knowledge for its own sake; but he has the sense and discretion to appreciate and apply for his own advantage that of others. He is a man about fifty-six years of age; very ugly, blind with one eye, robust, active, dissipated, warlike, of tried courage, and of wonderful endurance. When General Allard wished to quit Lahore, in order to visit France, the king was altogether dissatisfied: he long resisted the wishes of his favourite. "Let me at least detain thy children," said he at length to the general, "and then I shall be sure of thy return." "My children!" exclaimed Allard: "it is on their account that I wish to visit France; for there only can they be educated in the knowledge and practice of my own religion." At these words the king no longer resisted. "Since thou speakest to me of thy religion," said he, "I can no longer oppose thy will: this belongs only to thy conscience, and every one ought to follow the faith which he approves, and he is bound to obey its commandments. Thou mayest depart." Whilst he pronounced these words, he became greatly moved. He remained in deep thought for some time, as if he hesitated to give the general the farewell embrace: then casting himself into his arms and weeping violently, he dismissed him, saying, "Farewell, go in peace!"

Runjeet Singh is not therefore altogether a barbarian. General Allard states that he has often seen his ministers, some of whom belong to the faith of Mohammed, rise up in the midst of the council, interrupt their master, and retire to the extremity of the hall, in order to perform some ceremony, due to a particular hour just arrived. The king never makes any remark, but waits with admirable patience until such orisons are finished.

Runjeet Singh has many expensive tastes, one of which, if fully gratified, would ruin any other than an immensely rich man. He is attached to the chase, as conducted in the East. He has an ardent passion for precious stones and fine horses. He learnt one day that there was a very fine horse in one of the neighbouring provinces, in a part of the kingdom of Cabul not yet brought under his dominion. Spies were sent out in order to inform the rajah of the existence of the horse, and the exact spot where it was to be found. These two points being ascertained, a troop of ten thousand men were sent to seize the animal: they traversed many provinces, spent much money, fought their way to the stable of the horse, and did not rest until it was added to the stud of the rajah. He also obtained possession of probably the finest diamond in the world by similar means. A neighbouring petty king was said to be the possessor of a diamond, which had belonged to the Great Mogul, the largest and purest that was ever known. This of course was coveted by Runjeet Singh, and accordingly he invited the prince to his court, and being master of his person, he demanded his diamond. The king pretended to resist; but after many manœuvres he yielded possession. The delight of Runjeet Singh was extreme; he gave it to a lapidary to mount it; but what was his surprise and fury when the man informed him that this pretended diamond was only a piece of crystal! Runjeet Singh caused the palace of this king to be invested: his soldiers ransacked it from top to bottom. Their researches were all in vain for a long time: at length a slave of the king having sold the secret of his master, the diamond was found among the ashes of a fire. Runjeet Singh has ever since worn it as a trophy of victory, set in a bracelet of gold. On state days he wears, in chaplets round his head, many other diamonds of extraordinary size and beauty. It is said that the jewels of Runjeet Singh are the richest and finest in the world; and the riches and magnificence of his court and palace, the splendour of his travelling equipage, and of all his equipments, exceed probably all that we hear of among oriental princes.

We will devote a second paper to our account of this extraordinary person and his dominions.

THE GLOW-WORM.

WHEN on some balmy-breathing night of spring
The happy child to whom the world is new,
Pursues the evening moth of mealy wing,
Or from the heath-bell shakes the sparkling dew,
He sees before his inexperienced eye,
The brilliant glow-worm like a meteor shine
On the turf-bank, surprised, and pleased, he cries
"Star of the dewy grass! I make thee mine."
Then, ere he sleeps, collects the moistened flower,
And bids soft leaves his glittering prize unfold.
And dreams that fairy lamps illume his bower;
But in the morning, shudders to behold
His shining treasure viewless as the dust;
So fade the world's bright joys to cold and blank disgust.

CHARLOTTE SMITH.

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THE TOWN OF CLOYNE, IN IRELAND.

THE ROUND TOWER, AT CLOYNE.

CLOYNE is the name of a small town in the south of Ireland, situated in the barony of Imokilly, and the county of Cork. It stands at a short distance from the eastern shores of Cork harbour, and is described as straggling and miserable; it consists principally of one street, the houses of which are of an inferior description. It is a place of considerable antiquity, as is likewise the bishopric of which it is the seat, its cathedral having been founded by St. Colman, in the sixth century. The old name of the town is *Cluaine*, which signifies in Irish "a cave," and it is supposed to have been thus called, in consequence of the number of natural caverns and subterranean passages existing in the limestone-rock, of which the district is composed.

The town of Cloyne is situated on a small limestone eminence, gently rising in the midst of the valley, through which there might once have been a communication from Cork harbour to the sea; and this eminence might have been an eminence surrounded by water, and afterwards, on the water partially drying up, by a deep bog, and at present by rich and, in general, well-improved meadows, to which the plantations about the church and see-house, with the round-tower, appearing everywhere above them, give a good effect. On this spot St. Colman, before the year 600, is supposed to have founded his church; and the security of it must have received no small addition from the circumstance of a cave, which is on the most elevated part of it, extending in various branches under ground to a great distance. In those unsettled and barbarous ages, caves of this sort were resorted to by the natives on the first appearance of an enemy, and the invaders seldom being able to make a long stay, the wives and children of the peasants, and perhaps even their cattle, would remain in tolerable safety, till the country could assemble in their defence. It is certain that places of refuge of this sort were looked upon as of so much necessity, that on some of

the Hebrides we find artificial caves constructed for the purpose; and when nature had provided one so deep and roomy as this, the rude inhabitants of the times would as naturally graze their flocks and build their huts in its neighbourhood, as in latter days they raised their cottages under the shelter of a Norman castle. This idea will also receive confirmation from the name of the town *Cluaine*, signifying a cave in the Irish language.

At Cloyne a branch of the Fitzgerald family, distinguished by the title of Seneschals of Imokilly, had formerly two or three castles; they are the chief proprietors of the adjacent district, from which indeed their title was derived. The title was first bestowed in 1420 by James Earl of Ormond, Lord-Lieutenant of Ireland, on Lord Desmond, after whose death it was assumed by the head of his descendants, resident in the district. There is an account related of a skirmish which took place at Cloyne, between the Seneschal of Imokilly and Sir Walter Raleigh, and in which the skill and intrepidity of Raleigh were remarkable. Raleigh afterwards accused the seneschal of cowardice on the occasion; and such were the manners of the times, that Lord Ormond and Sir Walter more than once publicly challenged Sir John of Desmond and the seneschal, both of whom were in open rebellion, to decide the matter by single combat. In the year 1601 the Lord Deputy Mountjoy, on his return from the siege of Kinsale to Dublin, by way of Waterford, went out of his road to pay a visit to Cloyne, where he slept on the 7th of March, and was received by Master John Fitz-Edmonds, who held the town and manor-house in fee-farm, and who "gave cheereful and plentiful entertaynment to his lordship, and all such of the nobilitie, captaines, gentlemen, and others as attended upon him;" when the lord-deputy, "as well to requite his perpetual loyaltie to the crown of England, as also to encourage others in the like, did honour him with the order of knighthood."

St. Colman, the founder of the Bisopric of Cloyne, was the son of Lenin, the chief bard of Aedh, King of Munster; he died in the year 604. There are few records of the see till after the arrival of the English. About the year 1327, it appears to have become so impoverished, that King Edward the Third wrote to Pope John the Twenty-second, with the view of effecting an union between it and the see of Cork, which was likewise at that time much reduced. The attempt was at the time unsuccessful; but a century afterwards, the two sees, happening to be simultaneously vacant, were consolidated and granted to Bishop Jordan. This union continued until 1638, when a separate Bishop of Cloyne was consecrated by Archbishop Usher. During the civil wars the see was for some time vacant; but in 1660 it was again united to Cork and Ross, and this second union lasted till 1678, since which period Cloyne has been a separate bishopric. By the Act of 1833, however, relative to the temporalities of the Church in Ireland, Cloyne is to be reunited to Cork and Ross, as soon as the latter sees become void.

About the time of the Reformation the see of Cloyne suffered severely in its temporalities; in this respect it was not singular, every bishopric in Ireland being then exposed to similar injury. Ecclesiastical property in that kingdom was, to use the expression of Mr. Crofton Croker, "in a manner annihilated." Bishoprics, colleges, and tithes were divided without mercy amongst the great men of the time, or leased out on small rents for ever to the friends and relations of the incumbents, insomuch that "there was not," says Harris, "one bishopric in the province of Cashel that had not the print of the sacrilegious paw, upon it." Many Irish bishoprics, such as Aghadoe, Kilfenora, &c., never recovered from this devastation. The bishopric of Ferns was left not worth one shilling; Killala, the best in Ireland, was left worth only 300*l.*; Clonfert, 200*l.*; the archbishopric of Cashel 100*l.*; Waterford, 100*l.*; Cork, only 70*l.*; Ardagh, 1*l.* 1*s.* 8*d.* Cloyne, situated at a distance from the capital, an appendage to the neighbouring see of Cork, and without head or guardian, had very little chance of escaping in the general plunder. The outlying estates were seized by the nobility near them; and the demesne of Cloyne itself passed, by a fraudulent process, into the hands of the powerful family of the Fitzgeralds.

In the reign of Charles the First, some steps were taken to put a stop to the plunder of the Irish Church by laymen, and even, to a certain extent, to compel restitution. When Strafford went over as lord-deputy in 1631, he found the church in "a state of ruin;" many of the bishoprics, as Ferns, Lismore, and Cloyne were entirely destroyed, and the revenues of the others reduced to a trifle, the churches pulled down, or in a state of desolation, and the glebes and tithes in the hands of laymen; so that one nobleman in the western part of the kingdom, (the Earl of Clanricarde,) had no less than one hundred livings in his own possession; and the Earl of Cork, in the south, besides all the landed estates of Lismore and the college of Youghall, had impropriated all the livings belonging to both of them.

The cathedral of Cloyne is described as a "*small* heavy building, without any pretensions to ornament." Bishop Bennett, who was an eminent antiquary, supposes it to have been built between the middle and the close of the thirteenth century; it has no mouldings of the zigzag, nail-headed, or billetted kind, nor round-arched windows, which distinguish what is called the Saxon, or rather Norman architecture, before the introduction of the Gothic in the time of Henry the Third.

It is not evidently (says the learned prelate,) so late as that time, nor, on the other hand, has it the splendid arch or oak-leaved ornaments, so common in the middle of Edward the First's reign, therefore it is not so late as that period. I should be inclined to fix the era of its building to the latter years of the first of these princes, or the beginning of the reign of the last. The windows, though since altered, were evidently of that sort called lancet-windows, which were so common in the time of Henry the Third: see the great west window and that of the south transept: the latter on the outside, are additional arguments for the date I have chosen; as is also the circumstance that, about this time, three prelates out of four were Englishmen, in whose country monastic and cathedral architecture was in high estimation.

In the cemetery of this cathedral the tombstones are very numerous, owing, as Sir Richard Colt Hoare says, to the attachment which the Catholics still bear throughout Ireland to the ancient churches. Bishops Johnson and Woodward are buried there. "May the heavens be his bed," exclaimed the poor woman who showed Mr. Crofton Croker the interior of the church, on pointing out Bishop Woodward's monument; "when he died, the poor lost a good friend." Near it is a large and rather injured tomb of black marble, which originally belonged to the Fitzgeralds, and has been converted by the Earls of Thomond to their own use since the decline of the Fitzgerald family.

In the year 1776, when the cross-wall at the entrance of the choir was erected by Bishop Agar, the workmen digging deep in the nave to lay the foundation, they discovered a row of graves of rather singular construction, consisting of brick cells, each of which was exactly suited to the size and shape of the body contained in it. Curiously enough one of these

bodies was found to end at the shoulders, and to be unaccompanied by any of the skull bones. "It is, therefore, not improbable," as Bishop Bennett suggests, "that the head of the owner may have been fixed on Cork gates in the times of turbulence, as they appear in the print given us in the *Pacata Hibernia*, to be full of such kind of trophies."

The chief object of interest, however, at Cloyne is its Round Tower,—one of those singular monuments of antiquity, concerning the origin and use of which there has been so much controversy among antiquaries. It is not our intention, upon the present occasion, to give a general account of these remarkable structures, which are the only edifices of unknown date in Ireland deserving of notice as works of art, and, therefore, the only evidence of the skill and knowledge of the early inhabitants of that country. We shall content ourselves here with observing that, as to the period of their erection, they are "as *ould* as the hills" in the belief of the peasantry; and as to their use, they are variously supposed by different classes of antiquaries to have been,—the abodes of solitary anchorites,—the receptacles of a "sacred fire," worshipped by the primitive inhabitants of Ireland, after the fashion of the east,—places of temporary penance,—watch-towers erected by the Danes,—steeple-houses, and belfries.

The Round-Tower at Cloyne stands in the street, on the side opposite to the church, and, as usual, near its western front. This singular structure sustained considerable damage from lightning in the middle of the last century; its height is stated to be 92 feet, and the thickness of its wall 43 inches.

Adjoining the town is the Bishop's Palace, a plain edifice, which was built in the early part of the last century by Bishop Crowe. It stands in a picturesque demesne, in which are the entrances to some of the natural limestone caverns abounding in this district. The ancient name of this spot was *Monelusky*, or "Field of Caverns;" and the names of the neighbouring fields and grounds, says Sir R. C. Hoare, "speak the savageness of this place in former times." Thus *Knocknamodree* is the "Hill of the Gray Dog, or Wolf;" *Park na Drislig*, the "Field of Briars;" *Monecranisky*, the "Meadow of the Wild Boars," &c. On the north of the town is a hill called *Bohermore*, or the "Great Highway," from a tradition that a road passed over it from the sea in the south to the sea on the north of the kingdom.

In 1805 a curious discovery was made in one of the caverns in the neighbourhood of Cloyne. A quarryman accidentally let his crow-bar fall through a fissure in the limestone-rock; he widened the aperture and descended in search of the instrument into a cavern, in which he was surprised to behold a human skeleton, partly covered with exceedingly thin plates of stamped or embossed gold, connected by bits of wire, and likewise several amber beads. One of these plates was preserved, the rest of the gold was sold and melted in Cork and Youghall. The bones of the skeleton were eagerly sought after by the superstitious peasantry, who pronounced them to be those of St. Colman, and accordingly carried them away for charms. There is said to be a tradition in the country, of a battle having been fought near the spot in a very remote period, and of four kings having fallen in the conflict.

In the neighbourhood of Cloyne are two seats deserving of notice; one of them is Castle Mary, formerly called Carrig Cotta, which is supposed to be a corruption of Carrig Croith, or the Rock of the Sun,—a name derived from a cromlech, or Druidical altar, still to be seen not far from the house. This remain of paganism consists of a rough and massive stone, twelve feet in length; one end elevated about six feet from the ground by two smaller stones, from which its name of Cromlech, signifying a bending or inclined stone, is derived. Close by it is a smaller stone or altar, supported in a similar diagonal position by a single stone. There is a tradition, that nothing will grow under either of these altars, an opinion that originates from the total absence of verdure, incident to a want of sufficient light and air. The top of the larger altar was richly covered with the plant familiarly called the Wood Geranium, (*Geranium Robertianum*, or Robert's Crane's Bill,) the light feathery leaves and delicate pink blossoms of which formed a pleasing contrast to the solemnity and breadth of the altar.

The plantations of Castle Mary (says Mr. Croker,) are venerable and extensive, arranged in the taste of the last century. Few situations can be more imposing or romantic than that of the Druid's Altar, the descent to which is overshadowed by some luxuriant ash-trees, of singularly beautiful form and growth; the gigantic size attained by some surprises the English traveller, and their long, graceful branches, reaching to the ground, produce an effect not unlike the famed banyan groves of the east. Whilst Miss Nicholson was sketching the altar, a figure emerged from this depth of foliage, in costume which, had it been a tint whiter, might well have passed for that of a Hindoo; but the innocent deception was soon destroyed by the irresistible accent in which the following exclamation was uttered, after coolly surveying that lady's work, and the subject of it.—'Och! fait and sure the darlint lady isn't pulling down the ould stones may be! and as like as themselves it is, long life to her! well to be sure, and a power of trouble to be taking—*a wisha* God help us!'

Another remarkable seat in the neighbourhood of Cloyne is that of Rostellan, belonging to the O'Briens; it is situated on the eastern shore of Cork harbour, of which it commands a noble view. The present house is built on the site of a castle of the Fitzgeralds, and contains a small armoury. "The sword of the great Brian Boru, my lord's ancestor, King of Munster, your honour, and *his fowling-piece!* are there to be seen," said one of the gate-keepers who accompanied Mr. Croker through the grounds, and seemed anxious to display the wonders of the place to strangers. It is hardly necessary to remind the reader, that fire-arms were not introduced into Ireland till some centuries after Brian Boru was in his grave. But similar anachronisms are very common in Ireland, where anything ancient, wonderful, or curious, is without hesitation referred to Fion Mac Cuil, (the Fingal of Ossian,) St. Patrick, or Brian Boru. On an elevated terrace, near the water, is a statue of Admiral Hawke, "the position of which," says Sir R. C. Hoare, "rather surprised me, as the back of this celebrated warrior was turned upon the very element on which he had acquired such immortal honour.

I was told (he adds) that the following circumstance gave rise to placing the figure in this position. Upon the defeat of the French fleet, commanded by Conflans, in the year 1759, the city of Cork ordered a statue to be cast of the English admiral, Hawke; but on its completion, some objections were made to the expense by the citizens; upon which the noble Inchiquin said, 'that he would pay for it,' which he did, and, as a rebuke, placed the admiral's figure on a pedestal, with his back turned towards the ungrateful city. Mr. O'Brien, the present inhabitant of the place, and who, on the death of the Marquis of Thomond, succeeds to the Earldom of Inchiquin, told me a most singular anecdote relating to this same statue, and which, in a less enlightened age than the present, might have been considered as ominous:—'That the admiral's right arm, which grasped a sword, fell off on the very day that the French landed on the coast of Ireland at Bantry Bay.'

CORONATION ANECDOTES. No. II.

RICHARD I.

In a moneth mirie, Septembre the gynnyng
Baudwyn of Canterbirie com to coroune the kyng
Richard at Londoun, opon a Sonenday
At Westmynstre, tok the crown.

SUCH is Langtoft's brief memorial of a coronation, the first of which we have anything like a full account in the ancient chronicles. It will be seen, from the description, which we have compiled principally from Hoveden and Matthew Paris, that the forms and observances were nearly the same as those of more modern times.

Duke Richard having made all necessary preparations for his coronation, came to London, where he assembled the archbishops of Canterbury, Rouen, and Tours, who had given him absolution in Normandy for waging war against his father after he had taken the cross as a crusader. The archbishop was also present, with all the bishops, earls, barons, and nobles of the kingdom. When all were assembled in the prescribed order, the ceremony commenced. First, the archbishops, bishops, abbots and clergy, wearing their square caps, and preceded by the cross and holy-water bearers and deacons burning incense, went to the door of the royal bed-chamber, and led the duke in solemn procession to the great altar in the church of Westminster. Four barons marched in the midst of the prelates and clergy bearing four large wax tapers lighted; after them came two earls, one bearing the sceptre and cross, the other the rod and dove. Then came three earls bearing swords in golden scabbards taken out of the royal treasury. They were followed by six earls and barons, bearing a coffer (probably of relics) over which, the royal mantle and vestments were spread. Next followed the earl of Chester, bearing on high a golden crown, beautifully studded with gems. Next came Duke Richard between two bishops, over whose head four barons carried a silk canopy supported by gilt-headed spears. When they reached the altar, Richard swore in the presence of the clergy and people on the holy Gospel and the sacred relics, that he would observe peace, honour, and respect, all the days of his life, to God, holy church, and its ordinances. He likewise swore that he would administer justice in rectitude to his people, that he would abolish all evil statutes and customs, and that he would enact good laws.

His attendants then stripped him to his trowsers and shirt, the latter of which was left open between the shoulders on account of the anointing. Baldwin, archbishop of Canterbury, who wore rich buskins of cloth of gold, then anointed the king in three places on the head, between the shoulders, and on the right arm. A consecrated linen coif and a cap of estate were then placed upon his head, and he was vested with the royal robes, the dalmatic and the tunic; the archbishop then delivered him a sword, to restrain the enemies of the church. Two earls then buckled on his spurs, and invested him with the pall of state. After which Baldwin conjured him in the name of God, and forbade him to take the crown, unless he were firmly resolved in his heart and soul to observe all the promises to which he had sworn.

Richard replied that, relying upon the Divine assistance, he would perform all that he had sworn; after which, taking the crown from the altar, he delivered it to the archbishop, who placed it upon the king's head, and also put the sceptre in his right hand, and the rod in his left.

Thus crowned, he was led by the bishops and barons, preceded by the tapers, cross, and swords, to the throne. Mass was then sung, and, at the offertory two bishops led the king to the altar, where he made an oblation, and the like was done after the benediction. When mass was concluded, the king was led by two bishops, preceded as before, to the choir, where having assumed a lighter crown and robes, he then went to the coronation banquet. There the archbishops, bishops, earls, and barons, ranged according to their dignities, feasted sumptuously; and wine was supplied so plenteously, that it streamed down the floors and walls of the palace. Those who held lands by tenure of services at the coronation were in attendance, and performed their duties.

These festivities were sullied by a sanguinary and disgraceful riot. Numbers of Jews had flocked to England in the reign of Henry II., where they were honourably protected by that liberal and enlightened sovereign. Grateful for such unusual favours, they assembled at London to subscribe among themselves, in order to make Richard a splendid present on the day of his coronation. Unfortunately Richard was persuaded by some of the bigots who surrounded him, that the Jews were accustomed to practice magic on sovereigns during the time of the coronation, and he therefore issued an edict, prohibiting any Jew from entering the church while the ceremony was performed, or appearing at the palace during dinner. Curiosity overcame prudence; several of the most considerable Jews mingled with the crowd, and gathered round the gates of the palace. One of them, endeavouring to force an entrance, was struck in the face by an overzealous Christian; this signal roused the fanaticism of the multitude: a general assault was made upon the Jews, who fled in confusion towards the city. Some wretches, eager for plunder, raised a cry that the king had given orders for the extermination of the unbelieving Jews, and as this was by no means improbable, when the king was a crusader, it received implicit credit. The city mob, swelled by the multitudes who had come from the country, atttacked the houses of the Jews, which the inhabitants defended with great courage and obstinacy. The enraged populace, when night came on, finding that they could not break into the houses, hurled brands and torches on the roofs and through the windows. Conflagrations burst forth in various parts of the city, which consumed not only the houses of the Jews, but those of the Christians adjoining. The king, hearing of the disturbance, sent Ralph de Glanville, the chief justiciary, and other noblemen, to disperse the mob, but they were unable to control the infuriate rioters, and were forced to fly for their lives. Towards morning the rabble quarrelled among themselves about the division of the booty, and mere weariness, together with anxiety to secure their plunder, induced them to disperse. Richard caused several of the ringleaders and most notorious malefactors to be apprehended the next day; they were hanged as a terror to others, a proclamation was issued, taking the Jews under the royal protection, and the tranquillity of the city was restored. Few persecutions were felt more bitterly by the Jews than this massacre, as is manifest from the pathetic terms in which it is recorded by Rabbi Joseph.

"And King Henry fell sick, and died of grief; for the Lord raised up evil from his own house, when he was by the Castle Chinon.

"And he died, and his son Richard reigned in his stead, in the year four thousand nine hundred and fifty, which is the year one thousand one hundred and ninety;

and they put the royal crown upon his head in the city of London, in the royal palace, which was without the city. And there gathered themselves together in that place, much people from Yzarphat and from the isles of the sea. And also the Jews, the heads of the people, were among those who came to bring gifts unto the king. And the people murmured against them, saying, 'The thing is not right, that the Jews should look at the crown wherewith the priests crowned him;' and they pursued them and reviled them. But the king knew nothing of it. And a report was heard in the city, saying, 'The word came forth from the mouth of the king to destroy the Jews.' And they arose suddenly against them, and pulled down their houses and their towers, and killed of them about thirty men. And some of them slaughtered their children and themselves, that they might not abide that bitter day: there fell slain, Rabbi Jacob from Orleans, for the sake of the holiness of his Creator, on that fearful day. But of all this King Richard knew nothing, till he heard the voice of the multitude; and he said, 'What is this to-day?' and the doorkeeper said, 'Nothing; only that the boys rejoice, and are merry in heart.' And it came to pass, when he heard this great evil, his anger was much kindled, and his wrath burned within him. And he commanded, and they tied the doorkeeper to the tails of the horses, and dragged him, and cast him about in the markets, and in the streets, until his spirit departed, and he died. Blessed be He who giveth vengeance! Amen."

After his return from captivity, Richard had the ceremony of his coronation repeated, at the request of his nobles, who thought such a form necessary to remove the disgrace of imprisonment.

JOHN.

John ascended the throne, to the prejudice of the hereditary rights of his nephew Arthur, by virtue of a form of election. The archbishops, bishops, earls, barons, and other the estates of the realm, being assembled in the church of Westminster, May 27th, 1199, Hubert, archbishop of Canterbury, addressed them in these memorable words:—

"Hear all men! It is well known to your wisdom, that no man hath any right of succession to this crown, unless he be elected for his own merits by the unanimous consent of the kingdom, with invocation of the Holy Ghost; after the manner and similitude of Saul, whom God set over his chosen people, though he was neither the son of a king, nor sprung of a royal line; and in like manner after him, David, the son of Jesse, the former because he was brave, and suited to the royal dignity, the latter because he was humble and pious. So that he who surpasses all within the realm in fitness for royalty, should preside over all in dignity and power. But if any one of the family of the deceased sovereign should excel others, his election should be the more readily and cheerfully conceded. Wherefore, as our late sovereign Richard died without issue of his body, and as his brother, Earl John, now present, is wise, brave, and manifestly noble, we, having respect both to his merits and his royal blood, unanimously and with one accord elect him to be our sovereign."

This was the most decisive form of election since the Conquest, and it is so commemorated in Langtoft:

> The arsbishop Hubert of Canterbirie the se
> Com with gode hert to do the solempnitie
> At Westmynster thorgh assent of erle & baroun
> To that I ore ment* Hubert gaf the coroun.

The people responded with shouts of "Long live the king!"

* To him I before mentioned.

THE HOUSE I LIVE IN.

No. VI.

NUMBER OF BONES AND JOINTS IN THE HUMAN FRAME.

THE *cranium*, or that part of the head which contains the brain, consists of eight different bones. There are fourteen bones of the face, besides thirty-two teeth. Then there are four very small bones in each ear, and one at the root of the tongue. Thus the whole head above the neck contains sixty-three. The neck has seven; but as these form the upper part of the spine, they are usually reckoned with those of the body.

Here let us stop to comment on the simple, yet effectual, contrivance for increasing the security of the brain. Had the cranium, or brain-case, been composed of one entire bone, instead of several, fractures would have followed almost every injury on its surface, and such fractures as do occasionally take place, would probably be of greater extent and of corresponding danger.

The spine, or back-bone, contains twenty-four pieces, called *vertebræ*; and between these and the lower extremities are four bones more. There are twenty-four ribs; that is, twelve on each side, and a breast-bone, or sternum, down the middle of the front. Thus, that which is commonly called the body, contains fifty-three bones.

The upper extremity, including the hand, arm, *clavicle*, or collar-bone, and *scapula*, or shoulder-blade, consists of thirty-two pieces, or sixty-four on both sides. Each lower extremity includes thirty bones; and thus both together make sixty, besides the small *sesamoid** bones.

Now, if we add together these several numbers, we shall find that a complete human skeleton contains no less than two hundred and forty bones! Who would suppose this, from a mere view of the human figure, either while standing, or with the limbs in motion! We now see that it has a great many joints within it, and of course a great many bones. At every part of the body where the bones meet, there is more or less of motion (excepting at the junction of the several portions forming the head, face, teeth, and hips), and these may all be moved, nearly at the same instant. Thus there are in the human frame about a hundred and eighty joints.

We may, indeed, add to this number the small sesamoid bones, which are found in the thumbs and great toes of older persons, and somewhat resembling the knee-pan in shape, though very diminutive in size. Of these there are often two in each large joint of the great toe, and as many in the large joint of each thumb. Adding these, then, to the two hundred and forty, we shall have for the whole number of bones in the human frame, two hundred and forty eight.

Some make the number about two hundred and sixty; but in this fourteen sesamoid bones are included. It should be remembered that the number of sesamoid bones greatly varies in differen individuals, though nearly all adult persons hav some of them, and some individuals have them in other parts of the body besides those already mentioned. They are hardly ever larger than half a pea. In addition, it may be mentioned, that some individuals have two or more supplementary bones in the skull, called *ossa wormiana*; these, when they occur, are of an irregular shape, and seldom larger than small Windsor bean.

Besides all these, the breast-bone, the ossa inno-

* See *Saturday Magazine*, Vol. XI., p. 116.

minata, and many other bones of the body, are in young persons composed of several pieces, and some of them are often not very strongly united even when they become older.

Some few individuals are occasionally met with, who have a still greater number of bones; but these may generally be considered as diseased persons. A bony or chalky substance is often formed in the flesh of those who have the gout, and some of the gristly parts of the body—I mean the cartilages and ligaments—occasionally become *ossified*, that is, converted into a substance resembling bone, as do also small portions of the great arteries, or tubes which convey the blood. In some diseases, also, the bones become soft, and readily bend, owing to a deficiency of the earthy matter of which they are composed.

Occasionally persons are met with who have six fingers on each hand, or six toes on each foot, and sometimes both; but these supernumerary fingers and toes do not always have bones in them.

SKELETONS.

WHEN all the bones of a human being, or of any other animal, are put together, and fastened to each other by pieces of wire, the whole is called a *skeleton*.

There is, too, another kind of skeleton, but it is not so commonly met with; nor is it so convenient for use. It is made by stripping off all the soft parts of the body, excepting the ligaments; these are suffered to remain, and the whole is thoroughly dried. This is called a *natural skeleton*, in contradistinction to the former, which is called an *artificial skeleton*.

ANATOMY.

THE study of the nature and structure of the bones alone, is called *osteology*; that of the muscles, *myology*, &c. But as most people who study these, go farther, and learn also the shape and structure of the heart, the lungs, the brain, the blood-vessels, and, in fact, all parts of the body, some more general name seems necessary for what they do. Therefore we say of those who study all parts of the human body, just as it appears when the soul leaves it in death, the bones, muscles, tendons, brain, nerves, heart, blood-vessels, lungs, skin, &c., that they are studying ANATOMY.

PHYSIOLOGY.

PHYSIOLOGY is something more than all this. It is the study of the living animal;—how the heart, the brain, the eye, the ear, the muscles, the bones, and every other part, acts. David, the inspired psalmist, felt this, when, meditating on the curious structure of his own body, he exclaimed, "I am fearfully and wonderfully made." King David, however, had probably never seen a complete human skeleton, or even had much insight into the interior of the human frame; for in those days it was deemed improper to employ the bodies of men for the purposes of anatomical research, instead of which, the remains of the brute creation, particularly dogs, and other domesticated animals, were used. Hence many of the technical terms by which the various parts of our complicated structure are designated, though now appearing fanciful and erroneous, were at the time of their invention more correct, and the analogy much more obvious.

For many years past, we have been accustomed to consider it not only as allowable, but highly proper, and even necessary, to examine and dissect the human body after death, as it is by such means alone that the true structure of the human machine can be understood and explained, and the knowledge of its various derangements acquired. That the most intimate acquaintance with the different branches of *Anatomy*, *Physiology*, and *Pathology*, is highly requisite for those to possess who undertake to cure or to relieve the various "ills which flesh is heir to," is admitted by all who are competent to form an opinion on the subject.

I will here take the opportunity of defining the three words above-mentioned. By the word *Anatomy*, is meant a knowledge of the structure and proportions of the human, or of any other animal body; by *Physiology*, is meant a knowledge of the functions which the various parts of the body perform during health; and by *Pathology*, is understood an acquaintance with all those changes and alterations in the structure or functions which are effected by *disease*.

In these papers, it is my intention to describe a little both of anatomy and physiology, but into pathology I shall not enter, as that will be unnecessary for the general reader. Heretofore I have treated principally of anatomy; the remaining chapters will embrace a large proportion of physiology, combining, as we proceed, the two subjects together, showing the structure of a part, and at the same time pointing out its uses, by which method, after what has before been explained, a tolerably correct idea of the subject will be acquired.

BONES AND SHELLS.

BEFORE closing this chapter, I would observe that, although, except in very extraordinary cases indeed, the bones of deceased *human* beings are left to decay in the grave, the bony parts of the inferior animals are turned to great account in the domestic and useful arts. The handles of common knives, and innumerable little articles in every-day use, are made of bone; from which, also, some valuable products are obtained by the aid of chemistry. Ground bones make excellent manure for certain descriptions of land, and thus not only become valuable to the farmer, but furnish a beautiful illustration of the laws of nature, by which the constituent elements of the animal frame are made to contribute to the growth of vegetables, upon which human existence so greatly depends.

Ivory is another kind of bone, for it is the tooth of the elephant; as is also that useful substance, whalebone, which is part of the structure of the enormous jaws of the whale. From the *horns* of animals, combs, lanterns, whip-handles, and many other articles, are made, while the covering of the tortoise, and the shell of a certain species of oyster, furnish us with those beautiful substances, tortoise-shell and mother-of-pearl.

The shells and bones of animals not only serve as a support to the softer parts, but also as a firm defence. What would become of the tender frame of the poor tortoise, the lobster, the crab, the oyster, and many other living things, if they were not covered over, and protected, as with a shield, by a hard buckler of shell? The soft parts of the human body, which are most essential to life, are in many instances well defended in the same manner by the solid, unyielding materials which envelope them. As, for instance, the brain, the spinal marrow, the lungs, the heart, and the liver.

Now a portion of the shell of every animal is formed of lime. There is not so much difference between the bones of man and the shell of the tortoise, or the lobster, as may be supposed, though the colour is very different. A very large proportion of the lobster-shell is lime; in the tortoise-shell the quantity is much less; and horn contains but very little. Bones, as I have before observed, contain a large proportion of this earth.

RUNJEET SINGH,
CHIEF OF LAHORE.
No. II.

RUNJEET SINGH knows nothing of reading, nor do his sons. He is nevertheless the chief administrator of justice in his kingdom, and General Allard states that his judgments are on all occasions just and prompt. The civil state is thus organized: each village has a chief or judge, who is empowered to decide minor questions: affairs of greater importance are decided by a judge whose jurisdiction is more extensive than that of the former. The next officer in rank is the king himself: the king is easily accessible, and any one of his subjects can plead his own cause before him. There is a guard at the gate of his majesty's palace, who announces the suitors. If the king cannot receive them, he says, "Come to-morrow." A child without a home, or a man without bread, can prefer his request to the rajah, and never fail of his application, if he should appear to be a worthy object of the king's bounty. He exercises wonderful judgment and sagacity in deciding between man and man, and he is rarely, if ever, deceived in his judgment.

According to the laws of the country the punishment of death is never inflicted. A criminal sometimes has his nose or his ears cut off, but never his head. It is also not uncommon to cut off the criminal's hands. In serious cases, and where the culprit has again committed the crime for which he has been already once punished, the tendon of Achilles* is cut through. General Allard saw an unhappy wretch who was condemned to this punishment. This was a robber, who had had his two hands cut off for highway robbery. Thus mutilated, this man did not the less continue the exercise of a propensity which was irresistible with him. To his right arm a lance was firmly tied, and the bridle of his horse to the left arm: thus he went on the highway, and robbed almost as successfully as before. He was at length arrested and conducted before the king, who inflicted the punishment upon him which we have already noticed. Thus doubly mutilated, the robber was compelled to rest satisfied with the pension which Runjeet Singh allows to all the unhappy wretches whom justice has put out of a condition of gaining their livelihood except at the expense of others.

Runjeet Singh has not abolished the frightful custom whereby the women burn themselves after the death of their husbands. Runjeet Singh is a very courageous man; but he has not the courage to oppose himself to this shocking superstition of his subjects. In Lahore the women allow themselves to be burnt upon the funeral pile of their husbands, as was a few years ago the custom throughout Hindoostan; until, to the immortal honour of the English, this custom was abolished. In Lahore the women think it an honour thus to be immolated. This is a superstition which we fear will long resist all attempts to abolish it; since it renders of no avail the most powerful instinct of human nature, that of self-preservation and the love of life.

General Allard has in vain attempted the abrogation of this custom. Hearing one day that the widow of one of his officers had resolved to burn herself with the body of her husband, he sent for her and tried to shake her resolution; but in vain. He then threatened to oppose with an armed force this wicked and senseless suicide. The next day all his officers met in a body at his house, and represented to him firmly, but most respectfully, that they were ready to obey him in every thing that related to the military service; but that they could not and would not accept his law and decision in a matter of conscience concerning their religion. This, of course, was not to be resisted, and the widow was burnt.

General Allard was present at one of these sacrifices. The victim was a young and beautiful woman. She approached the pile, tranquil in appearance; but her countenance betrayed the internal struggle between nature and mistaken duty. She spoke a few words which were greedily listened to by those around, and received as infallible oracles; being her last words, *norissima verba!* She was splendidly dressed and covered with jewels. She mounted the pile and stretched herself upon it in the midst of the joyous shouts of the assistants, and the noise of loud instruments of music: but one of the pieces of wood which formed part of the pile, stood higher up than the others; this incommoded her; she got up again, removed the carpet upon which she had been stretched, put the wood in its place, and again extended herself on the pile. A large mass of fagots was placed upon her, oil was poured upon them, and thus they were ignited. General Allard contemplated this horrible and strange scene from the back of his elephant. He saw this unhappy woman perish, and she did not utter a cry. The spectators appeared highly edified with the scene.

Another object of superstitious regard in this country is the Fakirs; who, in order to preserve during their whole lives the attitude of prayer, tie their arms to the branches of a tree, and remain in this posture during six months, until the muscles become so hardened and dried, that they can no longer change the position of their arms. Such men are esteemed holy, and are respected and fed by every one, so that they soon become fat. Some of the Fakirs preserve the use of their arms, and carry about with them a matchlock, whereby they plunder the travellers. The French traveller Jacquemont (many of whose relations have been confirmed by Allard), complains bitterly of these Fakirs, by whom it seems he was more than once robbed.

It is an extraordinary fact that General Allard has made the army of Lahore almost entirely French. Its uniform, weapons, military schools, and even its flag, are almost precisely those of the French army in the time of Napoleon. It has also its grenadiers, hussars, dragoons, and infantry; and even the words of command are given in French †.

Every recruit enters the army freely, and of his own accord: but the people being warlike, and the occupation of soldier being the best of all occupations, recruits abound. The only difficulty the recruiting officers have, is to know when and how to refuse the numerous offers made to them. So that, when the king of Lahore wishes to augment his army, he has only, we may almost say, to clap his hands, or to strike his foot upon the earth, and, thanks to his general, there come out battalions ready for the field.

The system of victualling the army is extremely simple: the government has nothing to do with it. The soldiers are paid so much per month, with which they are obliged to provide their own food, and forage for their horses. If they are at war, they are fol-

* The sinew which connects the heel of the foot with the leg.

† Jacquemont visited General Allard at Lahore. The latter entertained the traveller in a sumptuous manner. Jacquemont speaks particularly of the surprise and delight which he experienced one day, when seated at dinner with his host, at the sight of what appeared to be a French regiment, which surrounded their dining-hall, and performed a variety of evolutions at words of command spoken by the native officers of Lahore in the language of France.

lowed by a band of merchants and of dealers of every description, who travel at their own cost, and sell on their own account, without being responsible to the officers of the army; except that the latter exert a sufficient authority to preserve order in these travelling caravansaries. The horse-soldiers have servants mounted like themselves, who provide forage for the horses. The facility with which an army of many thousands of men arriving in a country, which appears to offer no resources, and where human creatures would appear likely to perish for want of provisions, finds itself well victualled in a few hours, is, according to the recital of General Allard, an astonishing thing to behold; but, this it is, that has enabled the troops of the king of Lahore to undertake such extraordinary excursions, and to march into lands almost entirely unknown to the geographer, without ever experiencing those privations, which in other countries, so completely destroy military discipline.

The only essential difference between the costume of the troops of Runjeet-Singh and those of France is, that the former still wear the turban, with their long hair interlaced with folds of cachmire. The men pride themselves upon their hair; they connect with it the idea of strength and power. They also greatly respect the beard; a man is not thought to be such without it: young or old the beard must descend in streams of ebony, or of silver, upon the breast. General Allard has a long beard, which, when he was in France, he turned back behind his ears during meals. His uniform is that of a French general; his head-dress, a light helmet with loops of gold, of an elegant and commodious form.

Duelling is not known in the army of Runjeet-Singh; the soldiers settle their disputes with their fists,—a brutal, and equally unchristian, method of adjusting differences.

After a few months' stay in France, General Allard set out on his voyage back to Lahore, taking his wife with him, and leaving his children to be educated in the land of his fathers.

Before concluding, we should do well to observe, that the foregoing account does not contain the first instance of European skill and science, effecting great changes in the condition of any particular part of the world. The sovereign of Cochin-China, who had been dethroned by a party of his own subjects, in the year 1747, was enabled, by the assistance of Adran, a French missionary, to form, in the European style, a fine army and fleet, with which he not only recovered his own kingdom, but subdued those of his neighbours, southward of the empire of China.

THE ESCULENT SWALLOW,
(*Hirundo Esculenta.*)

THE esculent swallow is found in China, where it builds its singular nest in the rocky caverns on the sea coast; its nest has the appearance of hardened jelly or isinglass, and is esteemed by the natives of China, and other parts of Asia, as a great luxury; it is employed by them in the preparation of soups and other made-dishes. Marsden, in his *History of Sumatra*, says there are two sorts of nests; the white, which are less common, and the black or dark-coloured, which are more frequently met with. Some persons, however, believe that the difference in colour arises from accidental causes, such as the mixture of the dark-coloured feathers of the bird with the substance of which the nest is composed; and this belief is partly borne out by the fact, that if the dark-coloured nests are soaked in warm water, they become much whiter in their appearance; but the natives themselves are strenuous in the belief of their being built by two different species of swallow. Marsden, from personal observation, believes that the white nests are more recent than the other ones, and that in this the whole difference lies.

THE ESCULENT SWALLOW.

In the small island called the *Cap*, near Sumatra, two caverns were discovered by the embassy of Earl Macartney, which contained an immense quantity of these nests; they were composed of very delicate filaments, united by a transparent viscous substance, much resembling the remains of those jelly-like animals, the medusæ, which are frequently found on the sea shore. The nests adhered to each other as well as to the sides of the caverns, and were placed in uninterrupted ranks. An esculent swallow, apparently of another species, is also found in great abundance in deep caverns at the foot of the highest mountains in the interior of Java. This swallow is said to occupy two months in the preparation of its nest. The inhabitants of Java, who employ themselves in collecting these nests, (which, on account of the situations in which they are found, is rather a dangerous employment,) never begin their work without having in the first instance sacrificed a buffalo, and repeated a number of prayers; they then anoint their bodies with a sweet-scented oil, and after performing other superstitious ceremonies at the entrance to the cavern, they prepare for their descent. The fact of these caverns being situated in the centre of the island of Java, and not on the sea-coasts, seems to militate against the opinion that the birds collect the substances of which they form their nests on the shore; their nests are placed in these caverns in horizontal rows, from 50 to 500 feet in length.

Near some of these caverns a tutelar goddess is worshipped, whose priest burns incense and lays his protecting hands on every person prepared to descend into the cavern. A flambeau is carefully lighted at the same time, with a gum which exudes from a tree in the vicinity, and is not easily extinguished by the subterranean vapours.

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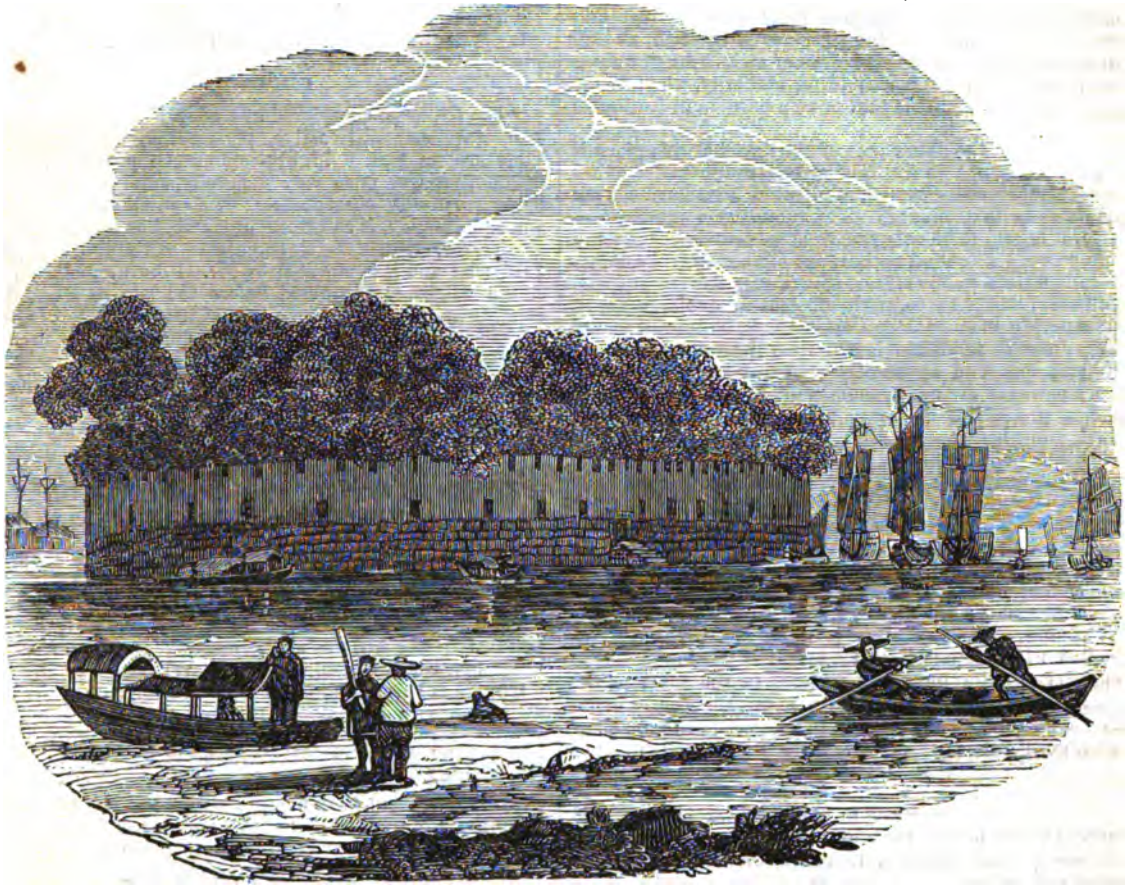
SOME ACCOUNT OF CANTON. PART III



FORT ON THE RIVER, NEAR CANTON.

THE HONGS OR FACTORIES.

THE word *Hong* is used by the Chinese to designate a commercial establishment or warehouse; and by this name the European factories at Canton have been designated. The hongs extend along the bank of the river between seven and eight hundred feet; they extend backwards in depth a hundred and thirty yards, into a long narrow lane, on each side of which are confined the abodes of foreigners. To the eastward, the line of factories is bounded by a narrow ditch or inlet from the river, serving to surround a portion of the city-wall, and to drain that portion of the town. All the factories communicate with the river by wooden stairs, from which the tea and other commodities are embarked; and the space which they occupy is traversed by three thoroughfares, leading direct from the river,—namely, China Street, New China Street, and Hog Lane,—the latter being a narrow filthy passage, inhabited by low Chinese, who keep spirit-shops, into which they entice the sailors, and rob them.

"The range of factories or hongs belonging to different nations," says Mr. Bennett, "having flag-staffs, on which the national colours are hoisted, from sun-rise to sun-set, are fine buildings, more particularly those belonging to the East India Company, which are of greater extent than the whole of the others. Several weeping willows are planted about the open space near the river, in front of the factories. The English and Dutch hongs have neat gardens laid out for a promenade, in front of them; but the open space before most of the others forms the 'quarter-deck,' where, every evening, the European residents take their limited walk."

Mr. Abeel gives a very entertaining description of the appearance which the open space in front of the factories presents, at different hours of the day. He says, that it "is the rendezvous of multitudes of the natives, who assemble daily, to transact business, gratify curiosity, or murder time. It is level for a short distance, beyond which it stretches over a large pile of rubbish, deposited here after the desolating fire of 1822, and retained, notwithstanding numerous applications for its removal, as a lasting and growing nuisance to foreigners.

"As the morning opens upon this scene silence retires, and the ears of the stranger are assailed by a new and peculiar combination of sounds. Human voices of harsh, drawling tones, cries of confined dogs and cats, screams of roughly-handled poultry, notes of feathered songsters, some of them admirably gifted and trained, with, at times, an accompaniment of very unmusical instruments, all unite in this inharmonious concert. The occupations of the tradesmen are varied. Meat, fish, vegetables, fruit, drugs, manufactures; everything saleable is brought to this general market. A number convey their portable kitchens hither, and prepare such dishes as suit the palates and purses of this promiscuous concourse. Others plant their barber's shop, or its necessary apparatus, in a convenient place, and spend their leisure hours in lolling about and conversation. Those who frequent the place for trade are

probably less numerous than the groups of idlers, who pass their time in listening to stories, witnessing juggling tricks, attending the operations and lectures of empirics, gaping at objects of novelty, and too frequently endeavouring to obtain each other's money by gambling.

"When the sun is oppressive the crowd retires, with the exception of the hucksters, who intercept his withering beams by temporary tilts. The erection of tents is a liberty not sanctioned by law, or, rather, contrary to the oral prohibitions of the petty officers who have the square in charge. Consequently, when men of authority make their appearance, the scene suddenly changes. From the moment of alarm there is the most hasty despatch until everything is removed that militates against their orders; their exit appears to be regarded as the signal of re-erection, and all things speedily revert to their former state. Such a show of subjection, with real contempt for authority, when it opposes individual gain, is said to be a prominent feature of the nation."

It is during the latter part of the day that this place is the general resort; in the cool of the evening the crowd becomes most concentrated, and, as a consequence, the clamour is quite deafening. Yet, tumultuous as is the concourse, it is said to be very free from contention or breaches of the peace. The least appearance of an unlawful commotion calls forth a public officer, who resides for the purpose, in full view, and is exceedingly efficient in quelling a riot and scattering offenders. This functionary, if occasion should arise, summons to his aid one or two lictors, who, armed with scourges, and apparently vested with a large discretionary power in the use of them, soon compel the unruly to make a precipitate retreat. The guilty are frequently chased, and when caught, dragged along to the hall of justice by the pendant *queue*, which is cruelly drawn over the front of the head, and made to press the face towards the ground.

"In surveying this mass of accountable beings," says the American Missionary, "there are many points of great interest to the eye of Christian compassion and benevolence. Independent of the associations which are common to all the heathen, there are facts of importance peculiar to this daily throng. Great numbers of them can read, and are attracted by every publication that meets their eyes. It is customary to paste up advertisements in the most public places of the square and the streets, and the groups generally found, through the day, gathered around them, show their eagerness to catch at every piece of information. What a place for the operations of the press, sacred to the cause of the Redeemer!"

The front part or entrance to the factories is near, and almost parallel to the bank of the river, and the intermediate space forms a general thoroughfare for persons who require any communication with the hongs, as well as those who have to embark and disembark at the different landing-places in front of them. There is no regular thoroughfare from the suburbs to the river-side through the private hongs, for the doors at the end looking towards the suburbs are locked day and night, and the front entrances are open only during the day; but there are two intervening streets and a lane, inhabited by Chinese shopkeepers, namely, Old and New China Streets, and Hog Lane, which are the general thoroughfares during the day; these, however, are also shut at night, according to the Chinese custom.

Mr. Holman compares the foreign factories to a succession of private streets, with a few merchants residing in each, whose stores are contiguous to their dwelling houses. "Each hong has its respective designation; for instance, the first you arrive at on your right hand on coming up the river, where there is a landing-place directly in front of it, is called Creek Hong, in consequence of being next a creek that communicates from the river to the heart of the city. This creek is a great nuisance at high water to the neighbouring hong, for at such time it is covered with boats passing to and from the city, loaded either with merchandise coming in, or offal &c., going out. Other hongs crowd the bank as you advance, and are generally distinguished by the names of the respective nations whose flags they display. The English factory is best known by the name of the British hong, and is the most considerable of them all. From the advantage of its position it can at any time stop the general thoroughfare in front of the line of hongs: but this power is never exercised, except when there is a dispute with the Chinese, in which case the gates are strictly guarded to prevent the admission of obnoxious or turbulent persons. There is no Russian hong nor will the Chinese permit any ships of that empire to visit Canton for the purposes of trade, assigning as a reason, that Russia already carries on a trade with them on the frontiers of their own country, and that they cannot be allowed to trade in two parts of the Celestial Empire." Mr. Holman gives the following list of these establishments, with the intervening thoroughfares, in the order in which they appear to a person coming up the river.

1. Creek Hong, Magniac and Co.
2. Dutch Hong.
3. Dutch Factory.
4. British Factory.

HOG LANE.

5. Chow-Chow Hong.
6. Hired Factory.
7. Messrs. Russell and Co.
8. Imperial Hong.
9. Dent and Co.
10. American Hong.

OLD CHINA STREET.

11. Hong Merchants.
12. French Hong.
13. Spanish Hong.

NEW CHINA STREET.

14. Danish Hong

COMMERCE.

"The Chinese, considered as traders," says Mr. Macculloch, "are eminently active, persevering, and intelligent. They are, in fact, a highly-commercial people; and the notion that was once very generally entertained of their being peculiarly characterized by a contempt of commerce and of strangers, is as utterly unfounded as any notion can possibly be. Business is transacted at Canton with great despatch; and it is affirmed by Mr. Milburn, and by most of the witnesses examined before the late parliamentary committees, that there is no part of the world where cargoes may be sold and bought, unloaded and loaded, with more business-like speed and activity."

An American writer gives the following illustration of this:—"While our officers," he says, "were at dinner with Mr. Lattimer, Mr. L. left the table for a moment, and returned so soon that he was scarcely missed. He informed his guests that he had made a sale while absent, of opium to the amount of two thousand dollars, and assured them that the Chinese are remarkably expert in business. Shopkeepers, from whom you may buy the most trifling article, supply ships with cargoes, worth two hundred thousand dollars, and will contract to do so with all the necessary security, in the length of time he had been absent from the table. They will manage all the smuggling, if any be necessary; get all the chops for duties; and deliver the articles on board the ship at Lintin, Whampoa, or Macao!"

Canton is very ill-suited to be the emporium of the British trade with China. In the first place the climate is comparatively hot, and secondly, the difficulties of conveying commodities thither from the interior of the country is very great. Two grounds are assigned for the policy which the native government have adopted within the last century, of confining the trade to this port. One is the desire to keep at a distance from the capital the danger of disputes arising out of intercourse with foreigners; and certainly Canton is very nearly at the farthest possible distance from the capital. The other is a desire to obtain the largest possible revenue from internal duties on the transit of goods; these are known to yield a considerable sum. Sir George Staunton mentions a "very ingenious memoir," written by a gentleman, formerly holding the appointment of Inspector of Teas to the East India Company, in China; clearly showing, upon an accurate and detailed comparison, between the expense of conveying black teas from the country where they are produced to Canton, and that of their conveyance from thence to the port of *Fu-tcheou-foo*, the capital of the province of *Fo-kien*, that the privilege of admission to the latter port would have been attended with a saving to the East India Company of £150,000 annually, in the purchase of that description of tea alone, besides affording us the advantage of another opening for the introduction into China of our manufactures and productions. Fu-tcheou-foo is but a short distance from the sea, in that part of the province of Fo-kien which lies opposite to the northern extremity of the island of Formosa; the largest Chinese vessels can ascend the river Mingho, almost to the very walls of the city, which is built upon its banks.

BRITISH INTERCOURSE WITH CHINA.

"As regards China," observes Mr. Auber, "we resort to a country in which we have not a foot of ground, and where we are confined to one port, at which our permanent residence is doubtful. The habits, manners, and customs are quite foreign to our own. The laws of China have been compared to a collection of consecutive mathematical problems, with this additional circumstance of perplexity, that a just and entire comprehension of each section individually, requires

a general knowledge of those that follow no less than those which precede. Such laws are also frequently violated by those who are (appointed to be) their administrators and guardians; where their treatment of foreigners is proverbially contemptuous; and in their commercial dealings they have no scruple at imposition, if circumstances favour the practice. Such is the character of the people with whom we seek to maintain an intercourse. . . . . China has rejected every effort made by us, as well as by almost every other European state, to form a commercial intercourse with her, upon those principles which govern commercial relations in other countries."

Sir George Staunton remarks, that upon the commencement of the present commercial intercourse of foreigners with the empire of China, nothing so much contributed to render them odious, both to the government and to the people in general, as their apparent disposition and tendency, upon almost all occasions, to a state of anarchy and disorder. The casual and unconnected adventurers who first traded to China, were entire strangers to the habits, customs, and language of the natives, as well as irreconcileably different from them in respect to all their national characteristics. It was obvious that to maintain order among such persons, and to regulate their intercourse with the natives, the ordinary rules and routine of Chinese justice would be, in most respects, utterly inadequate. As far, also, as the Chinese were enabled to judge, these foreigners were wholly without any internal government or system of control and subordination peculiar to themselves, which might have been capable of supplying the place, or at least, of coming in aid of the national laws; and which might, accordingly, have been accepted by the local authorities in China, as a sufficient substitute for those laws, in all cases in which their partial suspension or relaxation in favour of strangers was found unavoidable. Under the existing circumstances, therefore, the Chinese government deemed it necessary to supply the deficiency by the enactment of various new regulations and restrictions; and these were framed, as might naturally have been expected, with little regard to the feelings or interests of individuals who were not yet sufficiently powerful and united to command respect, nor sufficiently guarded and blameless in their general conduct to overcome prejudices and conciliate esteem. Thus, although the Chinese government did not absolutely prohibit foreign commerce, they resolved to provide against every hazard of ill consequences from its toleration, by the adoption and enforcement of the most jealous and vexatious precautions.

By the strict letter of these regulations, the continued residence of foreigners in China from year to year was totally forbidden; and during even the short period for which they were allowed to remain on shore, for the necessary purposes of their trade, they were required strictly to confine themselves to the small district which was allotted to them in the suburbs of the city of Canton. As a further security against turbulence and disorder, it was ordered that all foreign ships should be disarmed of their guns and other warlike stores, and that such articles should be retained in the custody of the government during the stay of the ships in port, and restored only at the moment of their departure. This order, though it has probably been but seldom enforced, and that only at a very early period of the trade, appears, nevertheless, to this day, unrepealed upon the Chinese statute-books In a printed collection of the edicts of the Emperor Këën-lung, (whose reign closed in 1795,) there is one which quotes this order; and after animadverting on its neglect, directs that it may be duly enforced in future.

Instead of foreigners being allowed to engage in anything like a free trade and intercourse with the natives generally, the whole of the foreign trade at the port of Canton was specially limited to ten or twelve Chinese merchants; and these merchants were required, in return for the licenses granted them, to undertake, jointly and severally, the most extensive responsibility to the government, not only for the due payment of all the duties and port-charges to which the foreigners might render themselves liable, but also generally for their orderly behaviour and good conduct. Besides these licensed merchants, a few other persons were permitted to attend upon foreigners in the capacity of *linguists* (interpreters), or *compradores* (victuallers); but with the exception of these persons and the individuals in their immediate employ, the natives in general were withheld, by the denunciation of very severe penalties, from either frequenting the houses of foreigners or holding any species of intercourse with them.

Such are the restrictions and disabilities originally imposed upon foreigners and foreign trade in China; in the lapse of years, however, several changes have taken place, and though some of the objectionable regulations are still subsisting in full force, the greater number have been, at different periods, either expressly repealed, suffered to become obsolete, or modified in practice, "in a manner so judicious and beneficial," to use the language of Sir George Staunton, "as to render their ultimate effect upon the trade rather advantageous than otherwise."

ITS EARLY HISTORY.

The Portuguese were the first Europeans who traded direct to China. They visited various ports of the country for some time free from the competition of other nations; and in 1555 they appear to have concentrated themselves at Macao, where they established a settlement. We hear of their ships frequenting the port of Canton in 1578, and trading along the coast of China; but in 1631, in consequence of some disputes which had arisen with the natives, they were restricted to their own settlement at Macao.

Until the year 1637, the English trade with the Chinese was carried on indirectly, at the factories which the East India company had established in other parts of the East. In that year, Courteen's Association, which had recently obtained a patent from the crown, conferring upon them the same privileges as were enjoyed by the East India company, seeking to distinguish themselves by extraordinary enterprise, sent out a large adventure, under the management of Captain Weddell. On the 27th of June, he arrived with several vessels off Macao, and transmitted to the governor a letter from Charles the First. The Portuguese gave him a cold reception, complaining that the native authorities had made them responsible, and imposed a heavy fine on account of his unwelcome appearance. Finding that they were not allowed to communicate with Canton but by shallow straits, and were excluded from the spacious channel of the Bocca Tigris, he determined to trace out the latter passage for himself. He despatched a pinnace with fifty men, which in forty-eight hours reached the mouth of this estuary, and began to ascend. In a few days they were met by twenty junks, with a great mandarin on board, who called them into his presence, and began roughly to expostulate on their thus "searching out the prohibited entrances" into the dominions of so great a monarch. Yet, on their expressing friendly intentions, and an earnest desire to accomplish their object, they were allowed to proceed to the vicinity of Canton. There, however, the hoppo and some other chiefs persuaded them to return to Macao, making lavish promises, none of which were fulfilled; and the Portuguese having amused Weddell till their Japan fleet had sailed, issued an absolute interdict against his trading any longer there. Determined, however, not to be thus baffled, he immediately weighed anchor with his whole fleet for the river of Canton, and anchored in the vicinity of a "desolate castle," the extensive ruins of which, we are informed, may still be seen immediately within the entrance of the Bocca Tigris. The Portuguese, meantime, studiously infused into the mandarins the belief, "that the English were rogues, thieves, and beggars." This, according to Mr. Gutzlaff, was no difficult task; such a conviction in regard to every foreigner, being at all times rooted in the mind of the government. Under its impulse, they privily conveyed into the castle forty-six pieces of cannon; and, when their preparations were completed, opened a fire upon one of his barges. Weddell was not a man to submit to such an outrage. He immediately caused his whole fleet to "berth themselves before the castle," and commenced a formidable fire, which the other party returned; but none of their shot "touched so much as hull or rope;" and when they saw the English boats, having on board a hundred men, making for the shore, the fort was speedily evacuated. They forthwith opened a communication, requesting a deputation to be sent to Canton; and when Mounteney and Robinson, two supercargoes, repaired thither, the authorities threw the blame on the Portuguese, granted permission to trade, and even to fortify any position outside of the river. These gentlemen agreed to pay 10,000 reals in duties, and, without further negotiation, began to load their vessels. The storming of the castle, however, rankled in the mind of the natives, who soon repented of this good treatment. Seven fire-junks were sent down the river, to destroy, if possible, the English fleet; which, however, avoided their attack, but the supercargoes were thrown into prison and almost starved. Mounteney determined to extricate himself, set fire to his apartment, threatening to burn the city; and having thus

made a passage, he rushed into the street, with a sword in one hand, and a purse in the other, to purchase provisions. On learning these treacherous proceedings, Weddell levied open war, laying waste the adjacent towns and villages, attacking and burning several vessels belonging to the imperial fleet. These cogent arguments brought the authorities once more to their senses. The merchants were requested to write to him, desiring that he would forbear any further acts of hostility, and "all would be well." They themselves were set at liberty, and allowed to conclude their transactions, which they did with all despatch, though much thwarted by the Portuguese. Mounteney is said to have entered into an agreement, by which his constituents were to pay annually 2000 taëls, (£666,) in return for free trade and residence. Rumour seems to have represented this voyage as highly profitable, since the company's agent at Masulipatam wrote,—"They have been to China, at a place called Canton, where they made such a voyage, that we conceive never Englishmen were so richly laden as they are with goods, and yet they flow with gold and silver in abundance." There is no mention in the captain's despatch of any such splendid success; nor do the association appear to have taken any steps to follow up the advantage.

The trade continued for some time in a state of depression. In 1664, the trade in tea commenced, that article being imported to the amount of one hundred pounds. On the 13th of February, the directors wrote thus to Madras: "In regard *thea* is grown to be a commodity here, and we have occasion to make presents therein to our great friends at court, we would have you send us yearly five or six canisters of the very best and freshest thea. That which will colour the water in which it is infused most of a greenish complexion, is generally best accepted." The import for general use had, it appears, been chiefly a private concern of the officers; but the market had thereby been so much over-stocked, that "trash thea from Bantam" had been sold for 4d. and 6d. a-pound. The trade was now, therefore, to be carried on altogether by the company themselves. Its progress, however, was severely checked by the imposition, in 1689, of an enormous duty of 5s. a-pound, which rendered it impossible to introduce with advantage any teas except those of the very finest description. In 1693 the staple commodities are said to have been Nan-king silks, damasks, satins, velvets, gold thread, raw-silk, China and lacquered ware, a good quantity of fine tea, some fans and screens. In 1699, there were ordered 300 tubs (chests) of the finer green teas, and eighty of Bohea.

In the month of November in this last-mentioned year, the East India company appointed a president with a council or select committee of four, two factors, and five writers, under whose commercial jurisdiction were placed "the whole empire of China and the adjacent islands." In 1701 Chusan, Amoy, and Canton, were the ports with which the company's trade was carried on; the first was deemed the most desirable, but they were compelled to quit it the following year, though afterwards induced to return. The company soon, however, acknowledged that "they were weary of the trade to Chusan and Amoy;" and they seem at one time to have intended to forsake those ports, and use Banjarmassin, in the island of Borneo, as a depôt. It was found, however, that at Canton the traffic could be conducted on a considerable scale; the factors were, indeed, exposed to many hardships, and had ground for heavy complaints, but the increasing importance of the tea-trade made the company willing to encounter many difficulties.

In 1715 the intercourse with Canton, according to Mr. Auber, had assumed somewhat of the character of a regular trade. At stated seasons ships were despatched from England, each having a supercargo, to conduct the sales and purchases. These vessels proceeded first to Macao, and thence to the Bocca Tigris, where the supercargoes were admitted to an audience with the hoppo, or Chinese commissioner of customs, with whom they stipulated for certain privileges, such as the enjoyment of free trade with all Chinese, without distinction, liberty to hire Chinese servants, to purchase provisions, &c., for their factory and ships, and other similar articles.

In 1720 the formidable confederacy of the cohong first appeared, but only as a combination of private merchants endeavouring to procure a monopoly price for their goods. Our countrymen refused to treat with them, and complained to the viceroy, when the parties were called into his presence and publicly reprimanded. In 1728 the merchants were driven almost to despair, by an addition of ten per cent, on their cargoes, while they were studiously excluded from all appeal to persons in power. Yet, as on recent occasions, when a small party acted with determination, and paid no regard to any prohibition, they found little difficulty in penetrating even to the palace of the Isong-tou, or viceroy. This was twice effected during that disastrous year. On the first occasion they saw his excellency himself, and received some fair promises; but on the second, a chung-ya, or subordinate mandarin, was deputed to receive them. He treated them roughly, upbraiding them with their very unceremonious mode of entry; and, on their threatening to leave Canton unless redress was obtained, said, "they might go if they pleased; other ships would come." He complained much of their troubling him about such a trifling affair. They replied, "that their trade, and the wrongs endured, were no trifles to them;" but he told them "they must apply to the merchants to get them a hearing." They answered very reasonably, "that as the grievances arose from the merchants, how could it be supposed that they would become instruments in any just accusations against themselves; the present case witnessed they would not." To this no reply was made, but the chung-ya finally promised that he would order his people to adjust the disputed points in an equitable manner. He dismissed them with a strict injunction "never to trouble him again on such trifling occasions."

In the year 1736 the emperor, Këën-lung, (who reigned till 1796,) ascended the throne, and the year of his accession was marked by the abolition of an oppressive duty of 4 per cent.,—although the boon was coupled with conditions utterly inadmissible, and which the Chinese were therefore bribed to connive at the neglect of. About this time, also, commenced the security-system, from which the British trade has so severely suffered. A few merchants, called the Hong, were nominated, one of whom was required, on the arrival of every English ship, to become security for the regular payment of the duties; in return for which the representatives of the company were obliged to allow him a corresponding advantage. These persons, burdened by the above obligation, and having also 10,000*l.* to remit in presents to the imperial court, found it necessary to indemnify themselves by an exorbitant price laid on the commodities.

The increasing annoyance to which the English trade at Canton was exposed, led the company to seek to re-open the communication with Amoy. But they found their condition still worse at that port; and were prevented from continuing the attempt, if they had been disposed to do so, by the decree which Këën-lung issued in 1757, strictly limiting the intercourse of Europeans to Canton. This made no change in the actual course of the English trade, which had long centred in that port; yet it acted unfavourably on the interest of the factory. Hitherto, amid all their grievances, the threat of removing to another, and thus depriving the mandarins of the emoluments which they derived from the traffic, had been used with the most beneficial effect. Now, the only menace left to them was, that of quitting China altogether,—a design which neither party could believe to be seriously entertained.

In 1759, two years after Canton had obtained a monopoly of the trade, when the authorities were no longer restrained by the apprehension that foreigners would resort elsewhere, the limitation of our dealings to a few licensed Chinese was made part of the established system of trade, and those individuals, designated Security or Hong merchants, were regularly incorporated under the name of the "Cohong," with whom Europeans were permitted to deal; all transactions with other Chinese, excepting, indeed, petty shopkeepers, being declared illegal.

In 1771, the supercargoes congratulate themselves on having procured the dissolution of this obnoxious cohong, at the cost of 100,000 taëls, (from £30,000 to £35,000,) which they actually expended on the occasion. In 1779-80, however, the same cohong appears again in full operation, and was made the instrument, as it has continued ever since, of levying an additional tax on foreign trade, under the designation of Consoo Fund, the origin of which is thus related. Debts amounting to 3,808,075 Spanish dollars, were owing by Chinese to British subjects, which the latter were unable to recover; and on their representation of the fact to the Madras government, Captain Panton, of his Majesty's ship, Sea-horse, was requested to proceed to China, in order to urge payment, and having instructions from Admiral Sir Edward Vernon, as well as from Sir Edward Hughes, to insist on an audience with the viceroy. This audience, after some delay, and not without the use of threats on the part of the British commander, was obtained,

when Captain Panton received a fair and satisfactory answer to his application.

"This measure," says Captain King, who visited Canton at the period in the Discovery, "had occasioned very serious alarm at Canton. The Chinese merchants who had incurred the debt contrary to the commercial laws of their own country, and denied, in part, the justice of the demand, were afraid that intelligence of this would be carried to Peking; and that the emperor, who has the character of a just and rigid prince, might punish them with the loss of their fortunes, if not of their lives. On the other hand, the select committee, to whom the cause of the claimants was strongly recommended by the presidency of Madras, were extremely apprehensive lest they should embroil themselves with the Chinese government at Canton, and, by that means, bring, perhaps, irreparable mischief on the company's affairs in China. For I was further informed that the mandarins were always ready to take occasion, even on the slightest grounds, to put a stop to their trading; and, that it was often with great difficulty, and never without certain expense, that they could get such restraints taken off. These impositions were daily increasing; and, indeed, I found it a prevailing opinion in all the European factories, that they should soon be reduced either to quit the commerce of that country, or to bear the same indignities to which the Dutch are subjected in Japan."

The result was, that the emperor published an edict, ordering the debts to be paid, but intimating great displeasure at their having been contracted, and prohibiting any such transaction from taking place in future. To guard against it, he directed that no communication should henceforth be held between the British and the merchants, unless through the medium of certain mandarins whom he named. The dealers alleging, doubtless with truth, that these officers would not perform this duty without a consideration, raised the prices of their teas, while they lowered those of the company's imports. The hong monopoly, in spite of every remonstrance, has been ever since maintained; though it has undergone much practical mitigation. These privileged individuals have lent their name to others, called outside merchants, who are thus enabled to traffic with the English. For this accommodation, however, a liberal compensation is, of course, exacted, which must be laid on the price of the goods.

Ever since this period the system of conducting the trade has been through hong merchants. In 1828, in consequence of the prohibition, under severe penalties, of dealings between Europeans and native traders not belonging to the privileged body, some foreigners petitioned the hoppo This functionary gave them a very decisive answer, in the usual style of Chinese courtesy: "The said barbarians," he observed, "a short time ago, repeatedly presented dunning petitions for things contrary to the law, which shows their stupid rashness. From pity to the remote barbarians I did not inflict chastisement, but ordered the merchants to deliberate safely and manage. I likewise ordered them to communicate my orders to the said barbarian merchants, to obey the fixed regulations in their trade. If the said shopmen dare to stir up the barbarian merchants to confused petitioning, or if they presume to trade with the barbarians, the moment they are discovered and caught, their crime shall positively be punished with severity. Their perverseness and stupidity have reached the acmé."

OCCUPATION OF MACAO BY THE BRITISH.

In the year 1808, when Buonaparte had developed his designs for securing the kingdoms of Spain and Portugal, an English force was landed at Macao, in order to occupy that settlement, and prevent its seizure by the French. This event, as Mr. Auber remarks, is deserving of particular attention, as it not only shows that we have recocognised the right of the Portuguese to the settlement of Macao, but marks the jealousy with which the Chinese view any approach to their territories by a foreign force, although with no hostile intention towards their nation, and evinces their determination to have withstood, however ineffectually, the extreme measures to which Admiral Drury, (then in command of the naval force in India,) manifested his intention to resort, in the prosecution of the service in which he was engaged.

It was in the month of March 1808 that the select committee of supercargoes at Canton communicated to the Bengal government, a vague report which had reached them, of the intention of the French with regard to the settlement of Macao. It was suggested that Macao ought to be placed in a better state of defence, and an opinion was offered, that no apprehension need be entertained of embarrassment from the Chinese government, if permission were obtained from the Portuguese for that purpose, although in fact, as it afterwards appeared, the Portuguese were under a pledge to the Chinese government, not to admit the troops of any nation into Macao without their previous consent. The Bengal government, however, upon the receipt of this information, resolved that a military force should be sent to occupy Macao; but the commanding officer was directed not to take any steps without the knowledge and concurrence of the select committee, who were cautioned to bear in mind the orders issued by Lord Wellesley in 1801, for guarding against the effect of jealousy on the part of the Chinese government.

About the middle of September, Admiral Drury, who commanded the naval part of the expedition, learnt that a considerable French force was off Java, and suggested the expediency of applying to the Chinese authorities for leave to land the troops at Macao. To this the select committee objected; and on the 18th of September they resolved, in opposition to the declared sentiments of the governor of Macao, and to the known feelings of the Chinese, to land the troops at once. When the landing took place, a letter was received from the hoppo, or chief officer of customs, protesting decidedly against the step. The admiral wrote to the viceroy, explaining the motives which had led to it; the reply of the viceroy contained a strong remonstrance against the adoption of such a measure without permission, and a threat of representing the whole affair to the emperor. The Chinese local authorities issued an order for the withdrawal of the troops, and declared that they would entreat the emperor to interdict in future the commerce of our ships. The Chinese troops, too, were ordered down to compel our troops to evacuate the town; and an intimation was given that in the event of non-compliance, they would burn the ships at Whampoa, secure the English, and put to death or otherwise punish them. A second division of troops was landed in October; and the select committee asserted "the impossibility of giving way to the Chinese so long as they persevered in their haughty conduct." They afterwards sent a letter to the viceroy, requesting that a person might be appointed to receive their representation upon the whole question; and, in reply, were informed that the viceroy had seen the letter, but did not think a compliance necessary, "as the troops must be removed, their remaining on shore being contrary to the law of the empire." In a subsequent conference with two of the Chinese merchants, the committee stated, that during the haughty conduct of the viceroy, the admiral could not remove any troops, "as it might have the appearance of fear."

The admiral then demanded an audience of the viceroy, who did not return any answer. Addresses were subsequently sent to him, but he remained firm in declaring the absolute necessity of removing the troops. The admiral declined advancing any further, "as the sword was half out of the scabbard, and his duty forbade him making war with China." At length the president of the select committee intimated his intention of ordering all British subjects to quit Canton in eight-and-forty hours; and declared it to be his opinion that the best effects would follow if his majesty's ships were brought to an anchorage higher up the river. Two days afterwards the president received a communication, in which the viceroy stated, that his (the viceroy's) conduct had been marked by the greatest forbearance; that he should not commence hostilities, though if we ventured to make war with China he was quite prepared for it; and that if the committee thought proper to remove the ships, he had no objection, only they must not expect to be permitted to return. At the same time, troops were brought, and encamped on the neighbouring hills; and it was threatened that fire-vessels should be sent down amongst the company's shipping. On the 4th of December the select committee assembled at Macao, to receive the emperor's edict for withdrawing the troops before the continuance of the trade could be permitted. "Knowing, as you ought to know," said this boasting document, "that the Portuguese inhabit a territory belonging to the celestial empire, how could you suppose that the French should ever venture to molest them? If they dared, our warlike tribes should attack, defeat, and chase them from the face of the country. Aware of this truth why did you bring your soldiers here? Repent and withdraw immediately; permission to trade shall then be restored. But should you persist and remain, the hatches of your ships shall not be opened."

A chop was addressed by the viceroy to the admiral, with the emperor's decree. A similar document was also addressed by him to the senior commander, captains, officers, petty-officers, and others belonging to the English ships at the port of Whampoa, and "delivered to the said senior commander, Captain Milliken Craig, of the Elphinstone, by the mandarins deputed by the Tsung-tuh, under a canopy of state, surrounded by Chinese guards, under arms, erected for the occasion on French Island, on the side of a hill, having a Chinese camp on each side on hills, each about one mile distant, and all in view from the van ships of the Hon. Company's fleet, moored in line of battle within gun-shot." This curious document is worthy of perusal.

"I, the mandarin Vu, by favour of my prince Tsung-tuh of the two provinces of Kwang-tung and Kwang-se, member of the Tribunal of War, &c., direct this letter to the captains, officers, passengers, and others, belonging to the English ships, to warn you, that being certain that your bad kingdom is situated on an island of the sea, and that you originally employed yourselves in making watches, to enable you to pay your taxes; afterwards, by the especial and profound goodness of our great emperor, who was desirous of benefiting you, he granted you permission to come to this empire to trade. Behold, what exalted and profound virtues belong to him!!! Notwithstanding this, the admiral of your kingdom, regardless of the laws, has brought here, for the first time, foreign soldiers, and, without leave, introduced them into Macao, and your chief supercargo uniting with him, they are with one accord making disturbances. This being the case, I informed the emperor, from whom I have just received a decree, in virtue of which I again send mandarins deputed to inform them that if they persist in detaining the soldiers, a great many troops shall be immediately despatched to destroy and extinguish them, and to terminate this business; for the consequences of which, the admiral and chief supercargo will be responsible; but you, captains, officers, passengers, and others, people of the ships, shall be free from all responsibility, if you remain quietly in the observance of the laws; and, after the soldiers of your nation shall be entirely withdrawn, I shall feel it my duty to inform the emperor, praying him to have the goodness to permit you to carry on your trade as formerly. But if you, giving ear to and obeying the admiral and chief supercargo, unite yourselves to them to create disturbances, when afterwards our innumerable soldiers shall arrive, who shall destroy and burn you, even if you were as hard as stone or jasper, I shall then not be able to use you with any indulgence, nor free you from the net of the law in which you will be ensnared; and in order that you may be obedient and discreet, I direct this chop to you. In the 13th year of the emperor Kia-king, on the 17th day of this 10th moon." (3rd December, 1808.)

The commanders of the company's ships at Whampoa, in their reply stated, that they had the exalted honour to acknowledge the receipt of his excellency's most gracious letter, delivered to them on French Island, by the two mandarins, whom, they were informed, it had been his condescending pleasure to send to them—that their only object in visiting China was commerce—that they endeavoured to venerate and obey its laws, but durst not, however, depart from allegiance to their own country, or to those who were dignified with its most exalted representation—that they understood that their admiral, at the request of the Portuguese, had landed some troops at Macao, to help them to defend it against attacks from the French—that that wicked nation, ever since they murdered their sovereign, had waged war upon all nations within their reach, and were understood to be then marching by land to make war upon the celestial empire, as the British navy prevented them by sea—and that they therefore most humbly implored his excellency to order the trade to be opened, that they might thereby find employment in the quiet habits of industry, &c. The viceroy, in his answer told them that, seeing they did not think proper to alter their way of thinking, he plainly knew that they had joined their opinions with those of their superiors, the admiral and president,—that if they did not wish to trade they might take away their ships as they thought proper, and if they did they must remain peaceable and obey the laws.

In the meanwhile the president, instead of relaxing, had begun to be more active in his preparations for defence; the batteries of the Bocca Tigris had fired upon the ships going up and down, and obliged one of them to return the fire, and on the 6th of December another camp had been observed to be formed upon the heights of French Island. It was upon the following day that the viceroy sent his answer to the commanders of the company's fleet; and on that day also he wrote to the admiral that he would cause all debts to be paid, stating for the last time "that while there remained a single soldier in Macao and the laws disobeyed, they should not trade," and if he hesitated for a moment, "innumerable troops would be sent to destroy him." On the 8th the president gave way, the admiral remonstrating against holding out any longer; a convention was concluded on the 10th, and the troops were embarked on the 15th.

"Thus," says Mr. Auber, the late secretary of the East India company, "after fruitless discussion for weeks, and the adoption of every measure short of hostilities to support the original plan of occupying Macao, the Chinese adhered to the demand with which they set out, namely, *the withdrawal of the troops*, to which the committee were obliged to submit before the trade was permitted to be resumed. Thus affording another decided proof of the inflexibility with which the Chinese insist on the observance of their laws and regulations."

Other writers view the matter in a different light, and think we did not succeed because we did not go far enough. Mr. Gutzlaff thinks that the British national honour was stained for ever; and says that a pyramid, recording the victory of Chinese cowardice over British imprudence is erected near the spot whence the admiral retreated. "He withdrew with his garrison from Macao; the English nation was viewed with greater contempt; it was written down in the Chinese annals, 'We have beaten the English;' The undaunted veterans of the Nile and Trafalgar had retreated." Mr. Mc Leod remarks upon this event, that after the retreat of Admiral Drury, there was no end to the gasconading of the Chinese. "They considered his retiring as a great victory gained, and it is celebrated as such by an inscription in one of their pagodas:—an inscription, by the way, which ought to come down."

DISPUTES OF 1829 AND 1830.

THE years 1829 and 1830 were marked by a series of vexatious discussions, excited apparently, less by Chinese encroachment, than by a strong desire entertained by the committee to liberate themselves from certain annoyances to which they had long been exposed. The entry-duty, of 2780 dollars, on every vessel, which had not fallen heavy on the large ships from Europe, was almost prohibitory on the small craft which carried on the traffic with India. The refusal of permission to the English to bring their wives and families to Canton, and to use sedan-chairs, the only commodious vehicle which could be procured, was resented as a grievance. The exactions, too, levied from the hong-merchants, by which several of them had been reduced to bankruptcy, greatly embarrassed the trade. The committee seem to have been chiefly encouraged to assume a high tone by recent observations on the radical weakness of the native government, and the facility with which they yielded to displays of superior power. By a repetition of these it was conceived that they might be overawed into granting any reasonable demand. Application was made for a naval force from Bengal; but the governor-general declined interfering, and referred them to the directors at home. They had at one time formed, and even announced their resolution, to stop the trade and leave China; but this design was not carried into execution. The natives acceeded to the wishes of the English, so far as to create new hong-merchants in the room of those who had become insolvent. But every other demand was repelled with their usual determination, and even with contumely. In their replies and proclamations, the following expressions occur:—"Since the said foreigners come to trade, it is incumbent on them to obey implicitly the orders of government. If they dislike the restrictions, it is perfectly competent of them not to take the trouble to come from so great a distance. The contemptuous resisistance of the foreigners arises from no other than a special design to coerce us by the circumstance of their paying much duty. The celestial empire views these duties as really not of the importance of a fibre or particle of dust. How can the chief Baynes (the president of the select committee) resist the prohibition and orders, and bring with him a barbarian woman (Mrs. Baynes) to Canton! If she will remove early to Macao, he will avoid a severe scrutiny. As to sitting in sedan-chairs, it is in itself a small business; but foreigners being in the provincial city, have hitherto not been allowed to ascend sedan-chairs. The said foreigners, ignorant how to be excited to

gratitude, turn round, and because of the proclamation disallowing them to bring barbarian women to Canton, and to sit in sedan-chairs, present whining petitions. The flowery nation and the barbarians must be distinctly divided; between those inside and outside there must be erected a great boundary. It is incumbent on the said chief and others to take the authoritative decisions which have been issued, and promulgate them for information. Why do they again, and a third time, obstinately refuse to transmit those injunctions, and dun us with requests to give a written document in return? Exceedingly does it indicate refractory stupidity. Hereafter it will be absolutely necessary to yield implicit obedience to the laws and regulations of the celestial empire, and adhere strictly to old arrangement. If, again, any dare to oppose or transgress, and again create disturbance, then, assuredly, in immediate adherence to the imperial will, a severe scrutiny will be made, and punishment inflicted. Decidedly, there will not be the least clemency or forbearance shown. Tremble at this! Intensely are these commands given!"

The court of directors, on these transactions being reported to them, disapproved so entirely of the conduct and views of their agents, that they came to the unanimous resolution of appointing a new committee. They decidedly abjured every intention of coercing the Chinese by threatening measures. In a subsequent despatch in 1832, they say, "The commerce between Great Britain and China is too important to be put to hazard without the most urgent and imperious necessity, and on no account upon considerations of a personal nature. It is a notion so commonly entertained and acted on by you, and encouraged by foreign merchants residing at Canton, that nothing is to be gained from the Chinese by obedience to their laws and edicts, but that much may be obtained by intimidation. You may have succeeded for the moment in setting the government at defiance; but that government has not only taken the first opportunity to assert its dominion, but also, with the view of making you feel the consequences of disobedience, it has almost invariably deprived you of some advantages which it had either tacitly or avowedly yielded to friendly remonstrances."

OPENING OF THE BRITISH CHINA TRADE.

In the year 1833 an act was passed providing that the exclusive trade to China enjoyed by the East India Company should cease, from April 22, 1834, the company, indeed, being obliged to close all their commercial transactions from that day. In the same year another act was passed, regulating the manner in which the open trade, thus permitted, should be carried on; and this act provided for the appointment of a superintendent of the China trade; to whom, residing in China, were granted the powers deemed necessary for the purposes of commerce. The first person appointed to this office was the late Lord Napier, a captain in the navy; who received instructions to repair to Canton, for the purpose of discharging its duties. On the 14th of July, 1834, his lordship arrived, in the Andromache, at Macao; and soon after sailed for Canton, which he reached on the 25th.

In a former year, the viceroy of Canton, in an edict issued with reference to the approaching change in the trade, had said, "I hereby issue an order to the said hong-merchants, that they may forthwith enjoin my command on the said nation's chief, early to send a letter home, that if, indeed, after the thirteenth year of Taou-Kwang, the company be dissolved, it will, as heretofore, be incumbent to deliberate, and appoint a chief who understands the business, to come to Canton, for the general management of the commercial dealings; by which means affairs may be prevented from going to confusion, and benefits remain to commerce."

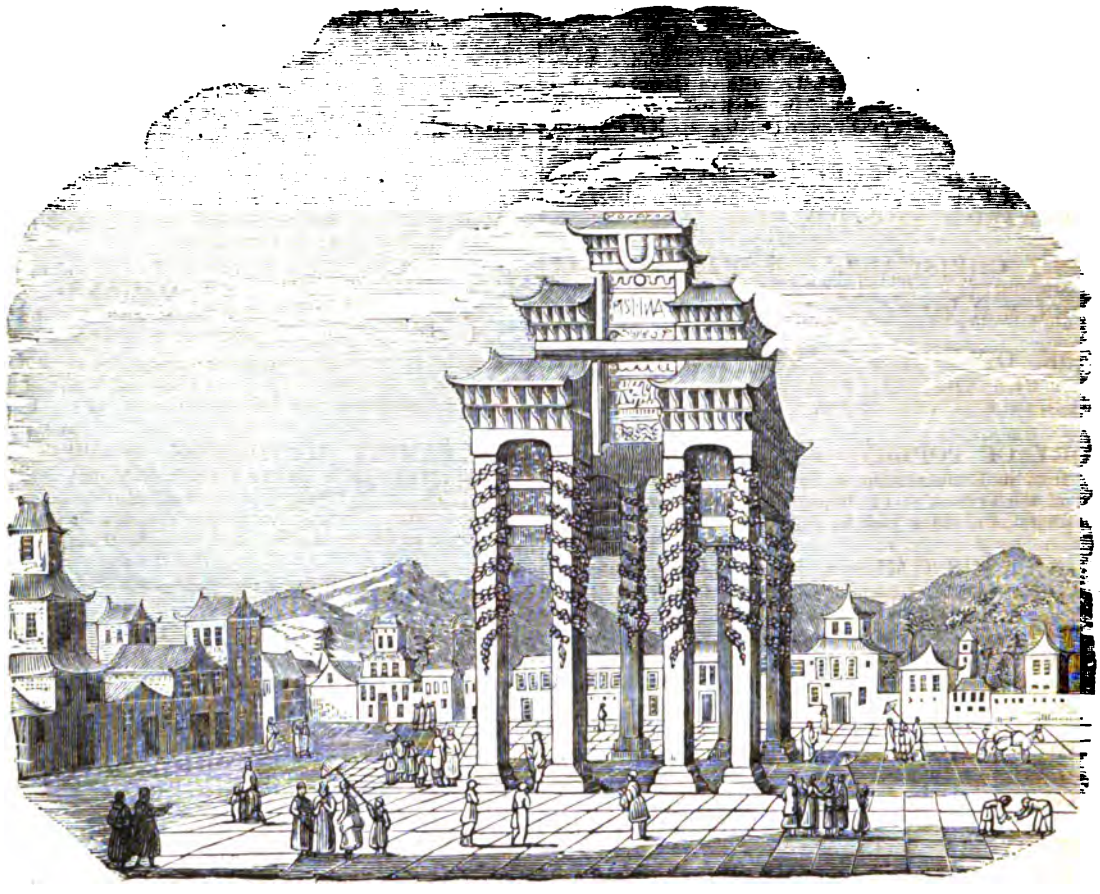
Before Lord Napier's arrival at Canton, all his movements had been closely watched by the Chinese government. A report was made that an English vessel of war, having on board a *barbarian eye*, (officer of rank,) had anchored at Cabreta Point, near Macao. Hereupon Loo, the governor of Canton, having understood that the English company was dissolved, and judging that this new officer was to supply the place of their tae-pan, or supercargo, issued an order that the hong-merchants should proceed to Macao, and ascertain what were the circumstances under which the trade was now to be conducted, and the regulations that would thence become necessary. Notice was given at the same time, that until a full report was made to the governor, and his consent obtained, the superintendent, though he might reside at Macao, was by no means to present himself at Canton. In pursuance of this order, Hou-qua and Mou-qua, deputed by the hong, proceeded to Macao, but before they could reach that place, Lord Napier had set out; and, notwithstanding all their efforts to overtake him, he arrived at Canton before them. Next day, a letter from him to the viceroy was presented at the city-gates, but was rejected on account of its not being in the form of a petition. The displeasure of the government was immediately manifested by the disappearance of all the native servants in the employ of the British.

A strong sensation was now created in the city, and a report was made to the hoppo, that, on the 18th of the present moon, about midnight, "a barbarian ship's boat had arrived at Canton, bringing four English devils," who took up their abode in the factory. This being connected with the appearance of a British man-of-war in the outer seas, was represented as a clandestine stealing into Canton. The governor issued an order, declaring the impossibility, that in conformity to the laws of China, this new eye or officer could continue in that city:—"Even England has its laws; how much more the celestial empire! How flaming bright are its great laws and ordinances, more terrible than the awful thunderbolt! Under this whole bright heaven, none dares to disobey them. Under its shelter are the four seas. Subject to its soothing care are the ten thousand kingdoms." Actuated, however, by feelings of clemency, and allowing for the ignorance of national laws and customs incident to a stranger, he ordains, that if the latter, after having despatched the business on which he came, shall immediately return to Macao, and promise never to resort to Canton without special permission, the past offence will be overlooked.

The hong merchants tried all the means in their power to induce Lord Napier to give way; but his lordship having been refused access to the imperial officers, declined to communicate with the merchants. The latter, frustrated in all their endeavours, resolved to secure the good-will of their own government by proposing a suspension of the trade. By taking this course they obviated the suspicion of collusion, which probably induced the government to lay upon them so heavy a load of responsibility. In an elaborate mandate, issued by Governor Loo, their conduct is declared to be most highly praiseworthy, "manifesting a profound knowledge of the great principles of dignity." Yet he does not proceed immediately to take the strong step recommended. He pretends, indeed, that the trade and the duties arising from it, "do not concern the celestial empire, to the extent of a hair or a feather's down." But knowing the divine wish of his great master to cherish both those within and those without, he was unwilling to involve thousands of the latter in ruin for the disobedience and obstinacy of one individual. He therefore allowed a short interval, that the barbarian eye, said to be "a man of very solid and expansive mind, and placid speech," might have an opportunity to reconsider his rash decision.

At length, on the 2nd of September, the long-threatened order for the entire suspension of the trade was issued. Its effects were immediately apparent. Fresh provisions could no longer be procured, and Lord Napier and his suite were obliged to live on salt meat conveyed from the ships of war. Matters being thus brought to extremities, the resolution was taken to order up his Majesty's ships, Andromache and Imogene, which were anchored without the Bogue. The ships began to move on the 7th, and the forts defending the entrance of the river fired upon them. A contest ensued for an hour and three quarters, the time occupied in the winding passage of the channel, and the ships then anchored, in consequence of the state of the wind, until the 9th. On that day they proceeded on their way, and a contest again ensued with the forts on the shore, which, of course, were unable to prevent the passage of the vessels, though they occasioned the death of one man in each.

On the 11th another order was issued, in which the former demands of the Chinese government were repeated, and the conduct of Lord Napier severely stigmatized. Yet it was still intimated to him that, if he would repent of his errors and even then obey the laws of the empire, indulgence would be extended to him. It is unnecessary for us to detail the occurrences of the few days following, which rendered Lord Napier's position a very difficult one. His difficulties now were increased by severe indisposition, caused by toil and anxiety. Under these circumstances, he shrunk from the calamities which would ensue from the



TRIUMPHAL ARCH, AT CANTON.

continued suspension of intercourse; and on the 14th he announced his determination to yield, and to quit Canton. The ships of war, also, on the demand of the native government, were ordered to move out to Lintin. It was at first intended to bring up a British cutter for his lordship; but, by arrangements afterwards made with the hong merchants, two chop-boats were provided, in which he embarked on the evening of the 21st. Although there had been a full understanding that he should be conveyed in a commodious manner, suited to his dignity and with the utmost possible despatch, it was soon discovered that they were under the convoy of several armed boats, which proceeded so very slowly that they anchored for the night still in sight of the town. They reached Heang-shan on the 23rd, at midnight, but were there detained for nearly two days, amid a tremendous beating of gongs, noise, and confusion, which severely aggravated his illness. It was not till after the most urgent representations, that Mr. Colledge, the surgeon, obtained a pass to proceed; nor did they reach Macao till the 28th. His lordship's weakness, however, which, at his departure was so great, that he required to be assisted into the boat, had increased so much, that the attentions of his family and medical attendants were of no avail, and he expired on the 11th of October. The functions of superintendent then devolved on Mr. Davis.

The Chinese authorities, according to custom, transmitted to court a boastful account of this transaction; representing Lord Napier as having been admitted to mercy only after the most humble submission, and then ignominiously driven out of Canton. As it had, however, been previously necessary to intimate the fact of the ships having forced their way up the river in defiance of the forts, that proud government, unwilling to own its weakness, threw the whole blame on the officers employed. In the "vermillion-coloured reply," it was said, "it seems that all the forts are erected in vain; they cannot beat back two barbarian ships; it is ridiculous, detestable. The military preparations being reduced to such a state as this, it is not surprising that the outside barbarians regard them slightingly." By a mandate from the tribunal of war, the naval officer immediately in command, was degraded, and condemned to wear the cangue, or wooden pillory, in public at the maritime entrance. All the officers on duty at the forts were to carry the same disgraceful badge; he, the naval commander-in-chief, had, by gross negligence, shown himself wholly unworthy of employment, and was therefore deprived of it. Even Governor Loo must have his two-eyed peacock's feather plucked out and lose some of his titles; but, as he had announced certain active measures as now in operation for expelling the barbarians, he was allowed to retain the command, with injunctions, to carry his plan into effect.

The departure of Lord Napier was immediately followed by the re-opening of the trade, which took place on the 27th of December following. Speaking of Lord Napier, Mr. Reynolds, the historian of the *Voyage of the United States' Frigate, Potomac*, says, that his name will be remembered as that of a benefactor to the commercial world. "The English," continues this American writer, "have made a good beginning by battering down the Chinese forts on the river Canton; we hope they will follow it up, and with increased force teach the Chinese a still more impressive lesson of 'barbarian justice and prowess.' A certain amount of fighting is necessary, and the sooner it is done the better." To this sentence there is a note appended, rather curious for its amusing candour. "The English," says Mr. Reynolds, "who have so often fought the battles of their continental neighbours, will most probably perform this service, from which we shall be equally benefited; and should they now, as formerly, be content with the glory they may acquire for their pay, we cannot object, provided we increase our trade, and increase it we will."

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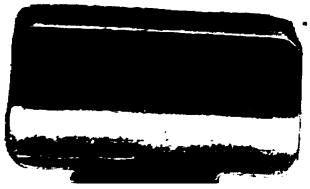

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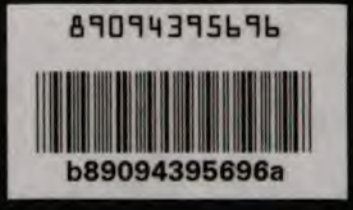

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